1 March 1978

Original: ENGLISH

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

# THE PROVISION OF FINANCE FOR INDUSTRIES IN DEVELOPING COUNTRIES WITH A VIEW TO EXPANDING AND DIVERSIFYING THEIR EXPORTS OF MANUFACTURED AND SEMI-MANUFACTURED GOODS

Report by the UNCTAD secretariat

UNCTAD/ST/MD/15
GE.78-63018

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*/ This report will be issued subsequently as a printed United Nations publication.

## I. INTRODUCTION

1. Conference resolution 96 (IV) contains a set of interrelated and mutually supporting measures for the expansion and diversification of manufactured exports from developing countries. This resolution, inter alia, calls for effective measures for the improvement of the supply capability of the developing countries regarding the exports of their manufacturing industries. Among such measures the provision of adequate financial resources for the manufacturing industries to enable them to expand and diversify substantially their exports of manufactured and semi-manufactured goods requires intensified considerations.

2. The design and implementation of suitable measures aimed at facilitating the provision of increased finance on adequate terms for exporting manufacturing industries have to be considered both at the domestic level and with regard to external sources of finance. The issues involved are manifold and complex and are connected with broader issues in the areas of money, finance and industrial policy such as: the mobilization of domestic savings; the possibilities of generating industrial finance through the development of domestic capital markets; regional financial integration among groups of developing countries; the access of developing countries to foreign national and international capital markets; the provision of bilateral aid by developed countries for industrial development; and foreign investment policies.

3. The purpose of this report is to initiate, by discussing a few issues, a broad-based examination of the problems which developing countries face in providing the finance required by manufacturing industries for the expansion and diversification of exports. In further stages of its work the UNCTAD secretariat will examine the issues involved in greater detail.

## II. THE FINANCING OF INDUSTRIAL EXPORTS

4. Manufacturers and exporters in the developing countries face a threefold competitive disadvantage vis-à-vis the export sector in developed market-economy countries with regard to obtaining finance in adequate measure and at reasonable cost. First, in the developed countries, the production and export of manufactured goods constitute an established sector of the economy which is able to offer the commercial banks an attractively large business volume. Secondly, the general level of money market interest rates in the developed countries is usually markedly lower than the interest rate level in the developing countries. Furthermore, major industrialized countries support out of public resources the provision of low-cost medium- and long-term export credit. Thirdly, the export sector in the developed market-economy countries has normally no difficulty in furnishing adequate bank collateral. In addition, their export trade in manufactures is, on account of its well established character, less risky than the non-traditional exports from the developing countries, whose exporters are establishing new business relations and venturing into new markets.

5. Accordingly, schemes for providing financial support for exports of manufactured and semi-manufactured goods from developing countries have to offer practicable solutions to three main issues involved: (i) assurance of easily available financing; (ii) competitive low-cost financing; (iii) insurance against foreign trade risks and assistance in providing bank collateral. The habitual way to achieve these objectives is the implementation of government-sponsored export financing and export credit insurance schemes.

6. The main methods applied to increase the availability and reduce the cost of finance for exports of manufactures and semi-manufactures are the operation of refinancing facilities for commercial banks with the central banks, government-sponsored export financing funds or specialized public financial institutions. The commercial banks are offered refinancing at concessional rates provided they do not charge the manufacturer-exporter more than a certain maximum interest rate which is fixed by the competent governmental authorities and somewhat higher than the preferential refinancing rate. In this way, the manufacturer-exporter obtains the finance at moderate interest rates enabling him to meet foreign competition.

7. Price competition by developed countries in export trade is particularly severe in the case of exports of capital goods which are sold on medium- and long-term credit of up to ten years or even longer at interest rates below market rates. The long maturities on these credits make manipulation of the interest rate a particularly effective instrument of price competition; a relatively small reduction in the interest rate can bring about a substantial reduction in the total sales price.

8. For developing countries, the promotion of their capital goods exports through officially supported preferential export credits poses a difficult predicament because the main buyer markets for the capital goods exports from the developing countries are again developing countries. On the one hand, the developing countries which export capital goods could ill afford a further softening of export credit terms to compete against the preferential credit conditions of the developed countries offering low interest rates, and long credit periods of up to ten years or more. On the other hand, it has to be taken into account that, as importers of capital goods, developing countries profit greatly from soft export credit conditions. The elaboration of a well-balanced solution which benefits the developing countries as both exporters and importers of capital goods constitutes a difficult undertaking.

9. It has been suggested that, if means could be found to enable developing countries exporting capital and other goods on credit to refinance the credit in private capital markets of developed countries, developing countries would be able to immediately realize the foreign exchange earnings. The importance of securing refinancing arrangements has been recognized by the Trade and Development Board which, at the first part of its fourteenth session, requested an examination of proposals including an export credit guarantee scheme to be sponsored by the international and regional financial institutions and regional development banks, as well as the question of refinancing of export credit with the aim of facilitating the expansion of exports from developing countries. 1/

10. An expert group accordingly convened by the Secretary-General of UNCTAD concluded that "it would be useful to establish a guarantee facility that would allow developing countries to refinance export credits directly in international financial markets on more favourable terms." 2/ Further examination of the

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1/ TD/B/528, para. 369.

2/ See report of the Expert Group on Export Credit as a Means of Promoting Exports from Developing Countries (TD/B/552), para. 43.

proposal at the technical level revealed that the establishment of such a facility as a separate international institution to guarantee medium- and long-term export credit paper issued by developing exporting countries was technically feasible and that there were no insuperable technical obstacles to its establishment.3/

11. The Committee on Invisibles and Financing related to Trade at the second part of its eighth session will give further consideration to this question.

12. The major problem of export-credit insurance schemes in the developing countries is the achievement of a cost-recovering operation at an early stage. The main factor which makes it difficult to accomplish self-sufficiency is the still comparatively small insurable export volume, in particular of manufactured and semi-manufactured goods, of many of their countries. Besides the problem of the economic viability of export credit insurance facilities, another difficulty faced by a number of schemes in developing countries is the shortage of trained professional staff.

13. To assist developing countries in establishing and operating export credit insurance schemes, developed market-economy countries may consider making available development assistance funds to export credit insurance institutions in developing countries to tide them over the financial difficulties during the initial phase of operation, until these institutions have reached self-sufficiency. Action may also be initiated on the establishment of export credit insurance facilities at regional or multinational levels. Such facilities would benefit in particular smaller developing countries where cost-recovering operations of national schemes probably cannot be effected for a long time to come so that the early establishment of a national facility would be incompatible with long-term cost-benefit considerations. Regional or multinational export credit insurance institutions could offer both direct insurance to exporters in developing countries without national schemes and re-insurance to existing national institutions. Consideration of the establishment of a regional scheme is currently being undertaken by governments in the ESCAP region.

## III. FINANCE FOR INDUSTRIES FROM DEVELOPMENT FINANCE INSTITUTIONS IN DEVELOPING COUNTRIES

14. To ensure the availability of longer-term capital at reasonable cost, government-sponsored development finance institutions have been established in many developing countries. These institutions supplement the commercial banking sector, which mainly provides short-term working capital. Development finance institutions may specialize on a particular sector of the economy or may be multi-sector institutions providing financial resources for two or more economic areas such as agriculture, industry, infrastructure, and tourism. Institutions which concentrate their financing activities on industrial development have been set up in a number of developing countries. 4/

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3/ See "An Export Credit Guarantee Facility: an examination of technical issues". (TD/B/655)

4/ For instance: Industrial Development Bank of India; Nigerian Industrial Development Bank; Pakistan Industrial Credit and Investment Corporation; Industrial Finance Corporation of Thailand; Industrial Development Bank of Kenya; Banque Ivorienne de Développement Industriel; Industrial Bank of Sudan; Malaysian Industrial Development Finance Berhad.

15. In the industrial sector, the promotional role of development finance institutions would consist in initiating and maintaining a viable process of industrialization geared to objectives and policy orientations which are consistent with the government's general development policy. Development finance institutions can provide manufacturing industries with various types of financing. The main service would normally be the provision of medium- and long-term loans. Other possible types of financing or of assistance in providing finance are guaranteeing the repayment of a loan made to the industrial entrepreneur by a third party such as a domestic or foreign commercial bank, the contribution of capital by investing in the equity of industrial corporations, the provision of underwriting services to help industrial enterprises raise finance from the investing public, and offering refinancing facilities to commercial banks which grant credit to the industrial sector. In the case of most developing countries, the financing needs of their manufacturing industries would not necessitate the provision of all the possible types of financing and financing services. The choice of the various types required to achieve the optimum promotional effect in the individual case can, however, be a difficult task.

16. As regards their financial resources, development finance institutions may attempt to attract capital from a variety of public and private sources, both domestically and from abroad. Among the domestic public sources, governments are the main suppliers of finance, normally in the form of equity and loan capital. Domestic private sources of finance can comprise commercial banks, insurance companies, business corporations and private individuals, investing in shares or bonds issued by the development finance institution. Foreign sources of capital for development finance institutions may be public sources such as governmental specialized financing institutions operated in developed countries to promote economic co-operation, 5/ regional development banks and the World Bank Group as well as private sources, such as foreign commercial banks and the foreign national and international capital markets.

17. Though the sources of finance of development finance institutions of developing countries differ over a broad range of possibilities, the financial resources which are actually mobilized from the various sources are in many cases not sufficient to provide these institutions on a consistent basis with the financial means required for a steady expansion and diversification of the industrial sector. As regards domestic sources of finance, many governments may find it difficult to substantially increase their financial contributions beyond the magnitude of means currently furnished. Future consideration may, therefore, in particular, bear upon suitable measures to enable development finance institutions to mobilize increased finance in the domestic capital markets.

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5/ Among the governmental specialized institutions of developed countries providing finance, mainly in the form of loans on preferential terms, and, in some cases, as equity capital, are the "Kreditanstalt für Wiederaufbau" of the Federal Republic of Germany, the "Caisse Centrale de Coopération Economique" of France, the "Overseas Economic Co-operation Fund" of Japan, the "Commonwealth Development Corporation" of the United Kingdom, and the "Agency for International Development" as well as the "Export-Import Bank" of the United States.

18. Furthermore, capital may be furnished to an increased extent from external sources. The governmental specialized financing institutions operated in developed countries to promote economic co-operation, the World Bank Group, and regional development banks may examine their capacity to increase the financial resources which they have so far made available to development finance institutions in developing countries. In particular, the possibility of making available greater amounts of finance on concessional conditions may be explored.

## IV. THE FINANCING OF SMALL-SCALE INDUSTRIES

19. In many developing countries, government-sponsored institutional arrangements have been implemented to facilitate the provision of finance for small-scale industrial firms. The variety of possible government-backed arrangements can be classified in six basic patterns: (i) a specialized small industry financing institution; (ii) small-scale industry "windows" in development finance institutions; (iii) a special fund administered by the central bank; (iv) joint financing arrangements between governmental financing agencies and the commercial banking sector; (v) refinancing facilities for commercial banks from an apex bank such as the central bank; (iv) credit guarantee programmes. The relative appropriateness of such alternative approaches necessarily varies from country to country.

20. Though detailed statistical operating results of the various schemes are not available, available information indicates that, with a few notable exceptions, most programmes have had only limited success in terms of substantially increased lending to small industrial entrepreneurs. The reasons are the lack of sufficient financial resources and administrative problems, in particular difficulties in covering the whole sector of small-scale enterprises. Currently, schemes reach only a fraction of the small industries. Effective measures are, therefore, required to strengthen the existing financing programmes and to implement schemes in countries which do not yet operate special arrangements but might consider them necessary to meet an existing need.

21. Special consideration may be given in developing countries to the implementation of hire-purchase schemes to promote the mechanization of small-scale industries. Under such schemes, the financing institution, instead of lending funds to small industrial firms for the acquisition of equipment, purchases the machinery required by the enterprises, and leases it to the entrepreneurs. As compared to the outright purchase of machines and equipment, the supply on a hire-purchase basis offers the advantage that the small entrepreneur is not required to furnish any security or surety, as is normally the case in respect of cash credit accommodation. As the concept of hire-purchase may still be an unfamiliar financing technique in many developing countries which furthermore involves complicated procedures, institutional aspects can post particular problems.

## V. MOBILIZATION OF FINANCE FOR INDUSTRIES IN DEVELOPING COUNTRIES IN THE EURO-CURRENCY AND FOREIGN NATIONAL AND INTERNATIONAL BOND MARKETS

22. Consideration may be given to effective measures to improve the access of the developing countries and their industries to the Euro-currency markets and foreign national and international bond markets. Improved access to these markets would make it easier for developing countries to raise medium- and long-term finance for the development of the industrial sector and its capacity to export.

23. Though the aggregate figures of publicized medium- and long-term Euro-currency borrowings by developing countries in recent years are quite substantial, an analysis shows that the bulk of the borrowing is done by not more than about ten developing countries, among them, a few oil-exporting countries. Borrowing at long-term through bond issues by developing countries in foreign national and international capital markets has been very limited in the past. It seems that the difficulties that the majority of the developing countries and their industries have in raising funds in the Euro-currency market and external bond markets are basically due to the fact that the creditworthiness of many developing countries and their borrowing entities is regarded as insufficient by potential lenders and, furthermore, that most developing countries cannot afford the high cost of private market borrowing. In addition, the access of developing countries to the national bond markets of developed market-economy countries is limited by various regulatory and other constraints. Although the restrictions apply uniformly to all foreign borrowers, in practice developing countries tend to be at a disadvantage in a restricted market.

24. In most markets, the main constraint seems to be the official authority required for foreign issues and the existence of issue calendars or ceilings. Furthermore, in the majority of capital markets, de jure or de facto priorities for domestic issues are in operation. A constraint particularly detrimental to developing foreign bond issues can be legal restrictions placed on the proportion of foreign securities which institutional investors such as insurance companies, pension funds and savings banks may hold in their total portfolio.

25. The legitimacy of the demand of developing country borrowers for easier access to the Euro-currency and external bond markets has to be recognized. An examination seems, therefore, required with regard to possible support mechanisms for developing country borrowers who seek to raise finance in external capital markets.

26. Consideration may, inter alia be given to possibilities of rendering assistance through the operation of guarantee and interest subsidy facilities. The basic idea of guarantee and interest subsidy schemes as a means to facilitate the flow of funds from world capital markets to developing countries has been the subject of international discussion for a long time. 6/ Such consideration has in the past been concentrated on facilities to be operated at the multinational level. Some proposals envisaged that an international institution such as the World Bank would raise the funds in private capital markets under government guarantees and relend the funds to developing countries at low rates of interest subsidized out of an "interest equalization fund" 7/ The use of multilateral guarantee facilities has also been studied by a Working Group established in June 1975 by the Joint Development Committee of the World Bank and the International Monetary Fund.

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6/ See: IBRD, The Horowitz Proposal, issued under cover of document TD/B/C.3/1 and Add.1 and 2; The Horowitz Proposal, Report of the group of experts, TD/B/C.3/23 and Corr. 1 and 2. The Horowitz Proposal: study by the UNCTAD secretariat, TD/7/Supp. 11; Multilateral interest equalization fund and related problems, report by the UNCTAD secretariat, TD/B/C.3/76; Financial mechanism for the future, report by the UNCTAD secretariat, TD/B/C.3/127.

7/ Such as the Horowitz proposal.

27. Future consideration may be directed to the implementation of multinational facilities and to guarantee and interest subsidy schemes to be operated at the national level in developed market-economy countries. Guarantee schemes at the national level could cover bonds issued by developing country borrowers in the domestic capital markets of developed market-economy countries. Suitable institutions for the administration of these schemes could be the government-sponsored agencies of developed countries currently providing guarantee cover for private investments in industries overseas, in particular in developing countries. Such investment guarantee schemes are in operation in the majority of the developed market economy countries. Apart from support mechanisms at the multinational or national levels, measures to eliminate the existing regulatory constraints on the access to external capital markets would be additionally required.

28. It has, of course, to be realized that the implementation of financing mechanisms proposed to facilitate the raising of finance in external capital markets by developing countries and their industries will require consistent efforts over a period of years in order to negotiate successfully the issues and problems posed by such schemes both at the political level and at the stage of practical realization.

## VI. PROVISION OF INDUSTRIAL AND EXPORT FINANCE TO DEVELOPING COUNTRIES BY PUBLIC MULTINATIONAL DEVELOPMENT FINANCE INSTITUTIONS

(The World Bank Group and regional development banks)

29. To assist the developing countries in increasing substantially their share in world industrial output and trade, future consideration of effective measures to reach this objective may include an examination of possibilities of both expanding and improving the lending by public multinational development finance institutions for industries and industrial exports. As the legitimate demand from other important economic sectors such as agriculture, transportation, power and water supply, and education necessarily limit the financial resources which can be apportioned to industries by the multinational development finance institutions, an expansion of the lending to industry would require an augmentation of the total financial resources at the disposal of the institutions.

30. Consideration of an expanded role of multinational development finance institutions in providing finance for industries would also include the examination of possible improvements in the lending policies and the terms and conditions on which the financial assistance is granted. Thus, the financing of industrial programmes instead of the traditional project financing arrangements may be made a regular feature of the lending operations. Currently, loans are only granted for the financing of specific projects, leaving aside a few exceptional cases in which the World Bank has extended loans for the financing of programmes. Programme financing would leave the developing country borrower in control of the choice of project priorities, project design, technology, and source of procurement and would simplify and speed disbursements to developing countries.

31. Furthermore, the purposes for which industrial finance is provided may be expanded and could include finance for equity investment, as well as finance to meet local costs and working capital requirements. Except for the International Finance Corporation, which is flexible in the kinds of financing it provides and grants finance for these purposes, the other multinational development finance

institutions operate on a more limited scale. The loans made by them are mainly intended to cover foreign currency costs arising from the purchase of the goods and services necessary for the execution of a project. Working capital loans and equity finance are not furnished. In the case of some institutions which are currently limited to loan finance, the provision of equity finance would require an amendment of their basic articles. Other institutions would need only to activate provisions in their articles already enabling them to undertake equity investments.

32. The terms and conditions on which the multinational development finance institutions provide their lending may be reviewed with the objective of easing the financing burden for the developing country borrower and making it possible to tailor the lending more closely to the needs of the individual situation. Currently, the maturities and grace periods on loans for industrial projects tend to be relatively short. Future consideration may, in particular, include an examination of whether the grace periods currently granted on industrial loans are adequately adjusted to the gestation period of the industrial project financed. Another issue concerns the lending practice whereby, in the case of loans granted from ordinary capital resources, the major portion of the cost involved in the execution of the project normally has to be provided primarily by the borrower, whereas the development finance institution furnishes only a minority share. Consideration may be given in the context of future replenishments of their capital resources to rising the average financing share provided by multinational development finance institutions.

33. Furthermore, efforts may be made to increase the use and to improve the conditions of co-finance arrangements combining the resources of the multinational lending institutions with finance from the private banking sector as currently implemented by the Inter-American Development Bank, the World Bank and the Asian Development Bank. These arrangements can mobilize additional private financial resources for industrial development in developing countries. On account of the confidence which the multinational development finance institutions enjoy in the private banking sector, their involvement in the lending encourages the participation of private financial institutions and banking consortiums. The involvement of the public lending institutions can also facilitate the extension of commercial credits to developing countries and their industries on more favourable conditions than would otherwise apply.

34. On the other hand, it has to be noted that under co-finance arrangements linking commercial finance to development finance, the borrower may find himself losing the qualitative advantages of commercial borrowing, i.e. speed as well as flexibility which leaves him in control of the choice and implementation of the industrial project to be financed. Furthermore, the commercially funded loan and the loan from the multinational development finance institution are linked by a cross-default clause which provides that if one of the loans extended to the borrower is called into default, all loans in the financing arrangement including the one granted by the multinational institution would also be declared in default. The cross-default clause works on the assumption that a borrower will not, under any circumstances, default on loans granted by a multinational development finance institution. Thus, the objective is to secure the repayment of the commercial credit portion by stipulating sanctions rather than by providing effective guarantee mechanisms.

35. Regional development banks may consider the creation of special facilities within their institutions for the refinancing of export credits extended by exporters of manufactured and semi-manufactured goods in developing countries. 8/ As the granting of export credits entails the deferment of the receipt of the foreign exchange earnings, such financing facilities would be an adequate way of enabling developing countries to realize the foreign exchange earnings before due date by external refinancing.

36. As the bulk of manufactured exports from the developing countries still consists of manufactures and semi-manufactures habitually sold on short-term credit, it seems advisable not to confine export financing programmes to capital goods exports on medium- and long-term credit. Furthermore, facilities established in regional development finance institutions may be designed to benefit manufactured exports to all buyer countries, rather than limiting the export refinancing to intra-regional trade. On the other hand, some selectivity as to the types of exports covered by the schemes may be considered as a means to support exports of industrial goods in accordance with national export promotion priorities.

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8/ See paragraphs 9 and 10 above.

UNCTAD/ST/MD/16

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

# Trade and structural adjustment aspects of the international iron and steel industry: the role of the developing countries

*Study prepared by Professor Ingo Walter*
*at the request of the UNCTAD secretariat*

UNITED NATIONS
1978

9 June 1970

Original: ENGLISH

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

# TRADE AND STRUCTURAL ADJUSTMENT ASPECTS OF THE INTERNATIONAL IRON AND STEEL INDUSTRY: THE ROLE OF THE DEVELOPING COUNTRIES

Study prepared by Professor Ingo Walter at the request of the UNCTAD secretariat */

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*/ Professor Ingo Walter is Associate Dean at the Graduate School of Business Administration, New York University. The views expressed in this study are those of the author and do not necessarily reflect those of the UNCTAD secretariat. The terminology used is that of the author.

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UNCTAD/ST/MD/16
GE.70-66163

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## SUMMARY AND CONCLUSIONS

1. Downstream processing of indigenous iron ore resources represents an attractive possibility for industrialization on the part of a number of developing countries. Besides the conventional developmental benefits, there may be significant linkage-effects into other sectors and potentially significant balance of payments benefits on both the export and import-replacement sides. Indeed, it is possible that a number of developing countries can generate an international competitive advantage in a range of steel manufactures. Some, such as the Republic of Korea, have already done so despite the absence of important indigenous resources. In many cases the size of national markets may require that efficient steel production be export-oriented. This necessitates access to foreign markets, and particularly the major steel-consuming centres in the developed market-economy countries.

2. As is well known, the steel industries in the principal steel consuming and producing centres of the United States, Western Europe and Japan have failed to to recover fully from the recent serious recession and are subject to severe structural adjustment problems. Alleviation of these problems may mean, inter alia, that in a truly competitive environment (a) there would need to be a downward correction in real wage rates among steelworkers, (b) part of the productive facilities in the industry must be written off, (c) advanced steelmaking technologies must become more widely adopted, (d) research and development must be pushed ahead, both in steelmaking itself and, especially, in the product and applications and, (e) new management must be brought into many existing steel firms to break away from old ways of doing things in the industry and create the environment where the aforementioned changes can be undertaken, and (f) governments must agree to let national and international steel markets work more efficiently by reducing or eliminating protection and subsidies, and moving rigorously against anti-competitive practices and damaging industrial concentration.

3. The probability of these developments actually taking place in the developed market-economy countries appears slight. Correction of wage rates implies widespread labour unrest. Correction of book values of capital assets implies bankruptcies and stockholder sacrifice. Industry modernization implies closing down old plants and regional unemployment or major adjustment assistance. Reorienting management implies major personnel changes and encounters executive inertia, for which the iron and steel industry has become renowned. And letting markets work means eventual disengagement of government from the iron and steel sector. Disengagement in this sense is theoretically not incompatible with government ownership.

4. It is easy to conclude that few, if any, of these major reforms will be undertaken in the iron and steel industry,and that growing cartelization of markets, trade restrictions and public subsidies will characterize the industry. Significant displacement of production in an industry as important as iron and steel will have major economic repercussions. Costs of steel-using industries will rise, impairing their international competitiveness and producing calls for

increased protection and other government aids. Demand for steel will stagnate as high prices shift user application to non-ferrous metals, plastics, fiberglass and other competitive materials. And on the trade side, there would most probably be some form of "orderly marketing" arrangements coupled to "acceptable" reference prices for internationally traded steel products.

5. The United States has traditionally been perhaps the most accessible major market for the world's exporters of steel. In times of economic expansion, it was able to accommodate significant steel imports while operating domestic mills at acceptable levels of capacity utilization. In times of contraction, however, the obsolescence and inefficiency of many domestic mills, combined with high labour costs, has led to import levels causing domestic production cutbacks and worker layoffs deemed politically and economically unacceptable. Overcapacity and recession in Europe and Japan, together with restriction of the European steel market especially to Japanese exports, led to a further surge of steel shipments into the United States, some accompanied by alleged dumping and other questionable competitive practices.

6. United States policy to deal with the problem focuses on restructuring the industry to make it more competitive with imports through government aids. Restructuring in this case does not mean contraction of the industry and re-absorption of the factors of production in other sectors. Rather, it means revitalizing an import-competing sector with a view to capturing an increased share of the domestic market, with imports themselves controlled by means of the reference price system. If the plan succeeds, the import controls can be removed in due course as the domestic industry becomes more efficient. If it does not, the import controls are virtually certain to remain in place as permanent protection for a high-cost, internationally-uncompetitive iron and steel sector. In either case, there will be pressure for the maintenance of safeguards to prevent injury from dumping, export subsidies and other "unfair" trading practices, possibly as part of an international market-sharing arrangement in the steel sector.

7. Like Japan and the United States, the European Economic Community was hit by a severe demand recession in iron and steel during 1975. Because European recovery in general was relatively slow during 1976 and 1977, so was the recovery in steel demand and capacity utilization rates in the industry. Overcapacity was made worse by investment in new plant and equipment designed to modernize and increase efficiency in the industry while at the same time it was found difficult to close down obsolescent plants at the same time. Coincidentally lay-offs of surplus workers have become difficult or impossible in many EEC member countries. Reduced demand and expanded supply has made the industry concentrate on export markets as a vent for surplus steelmaking capacity- thus making matters worse in other countries facing the same kinds of problems - and on restricting imports from outside the EEC. These elements have given rise to a co-ordinated set of plans to raise and control internal prices and profitability in steel, regulate productive capacity and imports, and bring about a far-reaching restructuring and modernization of the industry.

8. Structural differences in EEC national steel sectors have made implementation of various parts of the plan difficult, particularly in assuring conditions under which a European steel cartel can function. It appears, however, that some sort of organized market in steel will survive in the EEC and will determine its behaviour in the international steel market. This means limited access, via quantitative limits or import levies, for foreign steel supplies to the EEC market. It also means that the European Economic Community will assume an important and perhaps leading role in shaping any future attempts to organize and control international trade in steel on a broader basis.

9. In the case of Japan, steel production capacity far exceeds domestic requirements. The collapse of domestic consumption-from 509 kg per capita in 1973 to 356 kg in 1976, including indirect steel exports - and growing competition from developing-country steelmakers in export markets have sharply increased incentives to search for still further export markets. In 1976 Japanese steel exports reached 37 million tons, the highest level ever, accounting for 43 per cent of production and an increase from 37 per cent in 1975. All of this occurred in the midst of a global recession.

10. There is no question that the Japanese steel industry leads the world in efficiency and competitiveness. For developing countries, this means that the Japanese home market is not receptive to imported steel, basically because of a strong import-competing industry, quite apart from various types of trade barriers that may impede market access. It also means that the Japanese steel industry will be a permanent and effective competitor for developing-country suppliers in such advanced markets as the United States and Western Europe, as well as in the developing countries themselves and in the socialist countries of Eastern Europe and Asia. Basically, Japan has set the international standard for efficiency, quality and service in the global iron and steel industry. This does not, however, mean that developing-country suppliers cannot compete effectively with Japanese steel firms in particular product lines - the Republic of Korea, for example, already does so in a number of major markets.

11. Apart from its fundamental competitiveness, however, Japan's own trade practices have been subject to intense controversy in the iron and steel industry. The fact is that Japan itself imports virtually no finished steel - in 1975, imported steel accounted for less than 0.2 per cent of domestic consumption. Moreover, pricing policies and marketing practices allegedly enable the Japanese steel industry to avoid domestic adjustment to cyclical shifts in market conditions, and to transmit these shocks to major importing countries instead. This has given rise to significant adjustment problems in Europe and the United States, and has triggered pressure for import restrictions aimed at steel in general and imports from Japan in particular. There is little doubt that developing country steel suppliers will be affected by these protection-oriented practices.

12. Import controls of this nature aimed specifically at Japan may yield short-term gains for competing developing country suppliers. There is some evidence that this has already happened to some extent in the United States in

connexion with the Gilmore Steel anti-dumping case. 1/ But over the longer term Japanese export performance may well contribute significantly to a permanent system of controls on world steel trade. The Japanese do not appear to be adversely inclined to some type of arrangement of this nature. Such a scenario may be fundamentally against the interest of the developing countries, as well as being inimical to global efficiency and resource allocation in general.

13. In addition to problems of market-access deriving from difficulties faced by the iron and steel sector in the developed market economy countries, there clearly are also important supply problems for many developing countries intent on the establishment of an internationally competitive iron and steel industry. Steelmaking requires plentiful energy in the form of coal, oil, natural gas and electric power, wherein a substantial amount of substitution is possible by adopting different technologies. It also requires ferrous ore, steel scrap, coking coal, charcoal and manganese ore in the production process itself, again depending on the technologies employed. Coking coal and scrap have been identified as the most important constraints with respect to conventional technologies, apart from energy resources.

14. On the basis of resource and energy availability, various developing countries have been identified as being in a favourable position for creation of an iron and steel industry. 2/ These include Algeria, Angola, Congo, Egypt, Gabon, Libyan Arab Jamahirya, Morocco, Nigeria, Tunisia and Zaire in Africa; China, India, Indonesia, Iran, Iraq, Pakistan, Philippines, Saudi Arabia, Turkey and Viet Nam in Asia; and Argentina, Bolivia, Brazil, Chile, Columbia, Ecuador, Mexico, Peru, and Venezuela in Latin America. However, the UNIDO study also points out that lack of steelmaking inputs need not be a crucial constraint for the development of a viable steel industry as, for example, in Japan and the Republic of Korea.

15. Skilled manpower was identified in the UNIDO study as an important need for developing countries. Estimates to the year 2000 forecast the need for 60,000 engineers, 150,000 technicians, 230,000 administrative workers, 640,000 skilled workers, and 920,000 semi-skilled and unskilled workers if the developing countries are to come close to the Lima targets in the iron and steel sector. Experience in countries like the Republic of Korea and India shows that skilled manpower can indeed be developed, given an adequate educational infrastructure and sufficient time.

16. Capital needs are related partly to replacement investment and partly to expansion of steelmaking capacity. For the iron and steel sector, the UNIDO study estimates the need for 38 million tons of average annual additional plant capacity for 1975-1985 and 24 million tons of replacement capacity for the world

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1/ See paragraph 67 below

2/ UNIDO, Draft Worldwide Study of the Iron and Steel Industry 1975-2000 (Vienna: UNIDO, 1977). See also "The Iron and Steel Industry in the Developing Countries, Report of the Third interregional symposium on the iron and steel industry, held at Brasilia, Brazil, 14-21 October 1973" (United Nations publication, Sales No. E.74.II.B.15 (ID/139), 1974.

as a whole, of which 10.9 and 0.6 million tons would be in the developing countries. For the period 1986-2000, the estimates are 51-72 million tons of average annual new capacity and 30 million tons of replacements for the world as a whole, with 19.6 and 3.0 million tons for the developing countries, respectively. Calculating the current (1976) cost of steelmaking capacity at $600 per ton, this results in $25.4 billion in annual investments for the world as a whole, of which $6.2 billion would be in the developing countries for 1975-1985, while for 1986-2000 these costs are estimated at $33.1-$42.1 billion for the world as a whole and $11.3 billion for the developing countries, exclusive of cost of supportive infrastructure investments.

17. Spare parts present another problem, since they are often difficult to manufacture locally. UNIDO estimates the needs at 2,400-3,500 tons of spares per million tons of steelmaking capacity annually. Similarly, the design, engineering and supply of steelmaking plants and ancillary equipment has been largely the province of the developed countries, and hence represents import needs for the developing nations. Their ability to supply these capital goods themselves poses problems that will not be easily resolved. Nevertheless some developing countries have shown themselves capable of creating a heavy engineering and capital goods sector.

18. One concludes that there are reasons, ranging from low labour costs and local availability of raw materials to environmental considerations and transportation costs, why a number of developing countries could and perhaps should embark on industrialization in the iron and steel sector - this despite the supply difficulties that many of them encounter in the process. The real question is where the markets will be, and what will be the terms and conditions of access to those markets. Given the outlook for increasingly restricted international trade in the iron and steel sectors, what are the policy options available to the developing countries. These include, inter alia:

(a) Renewed efforts to achieve liberal trade in steel products, including reductions in tariff and non-tariff barriers and confining protection to time-limited, self-defeating emergency actions and clear-cut use of such measures for anti-dumping and countervailing purposes. Given the present state of affairs, liberal trade in steel does not appear very likely. But it is clearly in the best interests of developed and developing countries alike.

(b) Alongside the promotion of liberal trade policies in the iron and steel sector, the developing countries should press for continuation of coverage of steel imports under the Generalized System of Preferences and alleviation of restrictive provisions of individual GSP schemes. They should also encourage forward-looking restructuring and adjustment assistance in the developed market-economy countries to improve the equity and efficiency characteristics of the adjustment process.

(c) If, on the other hand, the iron and steel markets in developed countries become increasingly distorted by restrictive policies and this leads to severe distortions of international trade along multi-fibre arrangement or similar lines, the position of the developing countries may have to be quite different. It may require pressing for "special and differential" treatment for developing country producers through exemptions from quantitative restrictions of marginal suppliers, import shares negotiated on a special and differential basis, and the like.

(d) The possibility of essentially permanent distortion of international trade in iron and steel also raises the question whether the developing countries - where most of the growth in steel demand will come - should themselves strive to follow liberal steel import policies. It may be that they will be forced to protect themselves against disruptive imports from the major steel producing centres and follow "second best" policies such as regional free trade arrangements in the iron and steel sector.

## I. INTRODUCTION

19. One of the obvious options available to resource-rich developing countries is downstream or forward-processing of local natural resources. Increased domestic value-added creates opportunities for productive investment, together with a variety of backward and forward linkages into the national economy. It generates incomes and jobs in both skilled and unskilled employment categories. It benefits the balance of payments, both by increasing the monetary value of exports and by supplanting import expenditures. And it begins to change the traditional division of labour between developed and developing countries whereby production of raw materials is concentrated in the latter and manufacturing is undertaken in the former. Change in this traditional international division of labour is the intent of the Lima targets. Several industries based on renewable and non-renewable resources suggest themselves for forward processing in the developing countries. One of these, which has been subject to intense interest and scrutiny, is iron and steel.

20. Establishment of an export-oriented steel industry in developing countries promises substantial benefits, especially since the cost to them per ton of imported steel products is between 15 and 30 times the revenues per ton of iron ore exports. Yet there are some severe problems of market access and supply facing the developing countries. High capital costs, small internal markets, lack of skilled manpower, transport problems and questions of technology transfer are some of the supply factors that may make developing country steel exports uncompetitive internationally in price or quality, or both. These will be discussed briefly below, but have been analysed in much greater detail elsewhere.3/ The principal focus here will be on problems of market access, particularly tariffs and non-tariff barriers, slow growth of steel demand in major developed-country markets, as well as structural adjustment problems that have given rise to unprecedented pressures for protection in the steel sector.

### Patterns of production

21. Various considerations support the establishment or expansion of iron and steel facilities in developing countries. The ready availability of ferrous ore in many of them is of course an important consideration, although an absence of raw materials need not unduly impede development of an efficient steel industry, as Japan and the Republic of Korea have shown. Second, large integrated plants on coastal sites close to the sources of raw materials can provide important economic advantages. The highest-cost part of steelmaking occurs at the primary end of the production process, between the iron ore and coal in the ground and pig iron exiting the blast furnace under conventional technology. For this reason a large part of the innovation in steelmaking has been directed at the front end of the process. Third, steel facilities of the large, modern, flat-rolled type

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3/ See Commodities Research Unit, Study on the Degree and Scope for Increased Processing of Primary Commodities in Developing Countries (London: Commodities Research Unit, Ltd.: 1975).

can have important developmental benefits. Fourth, many industrialized countries are running out of physical and environmental space for large coastal integrated steel plants. In addition, transport costs associated with shipment of crude steel from developing to developed countries are less than those of transporting raw materials. This may even be true after considering the cost of shipping missing inputs such as coking coal to the developing countries. In any such division of labour, problems have to be resolved, and new forms of ocean transport developed through new types of specialized ships. But indications are that solutions in both areas are feasible in the foreseeable future.

22. As in other natural resource sectors, the developing countries have exported iron ore to the developed countries for steelmaking, often in pelletized form, representing about 88 per cent of their iron ore production. With the exception of Brazil and India, downstream processing of local iron ore in developing countries is still rather limited - for example, in Chile, Venezuela, Peru, Turkey, Angola, and the Philippines.

23. Before World War II developing countries produced merely 1.3 million tons of crude steel (most of it in India), corresponding to less than 1 per cent of world production. In 1974 (so far the peak year for world crude steel production) developing countries produced 33.1 million tons, or 4.7 per cent of world production. In 1975 and 1976 crude steel production continued to increase in developing countries to respectively 35.0 million tons and 39.3 million tons, 4/ while production in developed market-economy countries fell sharply in 1975 (by 16 per cent) and remained also in 1976 10 per cent below the 1974 output. As a result the share of developing countries in world crude steel production increased to 5.4 per cent in 1975 and 5.8 per cent in 1976.

24. According to UNIDO projections, steel output of the developing countries will grow from 36 million metric tons in 1974 to 125 million metric tons in 1985, representing an annual rate of growth of 12 per cent and an increase in their share of world steel output (excluding socialist countries) from 7 to 17 per cent, as indicated in Table 1. Meantime, steel production in the developed market-economy countries is expected to grow at a rate of only 2.6 per cent annually, with corresponding reductions in their share of global production. The UNIDO targets for the year 2000 call for a 10 per cent rate of growth in developing countries beginning in 1974, to a level of 416 million metric tons, or about 35 per cent of global steel production outside the socialist countries of Eastern Europe and Asia. These are lower-bound estimates, and while it is possible to contest the feasibility of attaining the forecast production levels, it seems clear that in relative terms the most rapid growth in world-wide steelmaking capacity for the remainder of this century will indeed take place in the developing countries.

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4/ In 1976 as much as 83 per cent of total crude steel production in developing countries were contributed by six countries: India, Brazil, Mexico, Republic of Korea, Yugoslavia and Argentina.

Table 1

Comparative projected growth for steel production, developed and developing countries, 1974-2000*

(million metric tons and percentages)

| | 1974 | % | 1985 | % | 2000 | % | 1974-1985 growth rate | 1974-2000 growth rate |
|---|---|---|---|---|---|---|---|---|
| Industrialized countries* | 462 | 93 | 613 | 83 | 777 | 65 | 2.6 | 2.0 |
| Developing countries | 36 | 7 | 125 | 17 | 416 | 35 | 12.0 | 9.9 |
| Total | 498 | 100 | 738 | 100 | 1 193 | 100 | 3.6 | 3.4 |

Source: UNIDO, Draft World-wide Study of the Iron and Steel Industry, 1975-2000 (Vienna: UNIDO, February 1977).

* Excludes socialist countries of Eastern Europe and Asia.

25. It can thus be argued that the Lima target for steel production requires that, first, steel mills in the developing countries obtain a growing share of developing-country markets, which are expanding substantially faster than the demand for steel in the developed countries. Second, it requires a shift in supply of finished steel to the major developed-country markets from domestic mills and imports from other developed countries to imports from developing-country mills. This could be accompanied by a qualitative shift in supply patterns whereby the developed countries concentrate increasingly on more sophisticated steel, including tool steel and other specialty steels, while the developing countries concentrate increasingly on less sophisticated products including structural steel and possibly semi manufactures.

Patterns of demand and international trade

26. As the UNIDO study indicates, the growth of the iron and steel sector tends to flatten out as successively higher levels of income are reached. By 1970 per capita steel consumption in the developed market-economy countries had reached about 310 kilogrammes annually, from only about 45 kilogrammes in 1910, but since that time it has essentially levelled off. The income elasticity of steel consumption (percentage of increase in steel consumption divided by the corresponding percentage increase in real incomes) has been systematically higher in developing than in developed countries and, furthermore, the elasticities in developed countries declined between 1950 and 1970. Similar behavior is found in the income elasticity of steel production. For example, it was calculated at 2.15 for large countries averaging $225 per capita GDP in 1973, 1.35 for large countries with $500 GDP per capita, and 1.20 for large countries with $3,000 GDP per capita. Income elasticities were higher in small countries - for 1973, they were 3.91 at $225 average per capita GDP, 3.18 at $500, and 1.84 at $3,000. As noted, for its forecasts to the year 2000, UNIDO has assumed consumption and production growth rates of 2.0-2.5 per cent per year for developing countries (three or four times higher than that for consumption) and in the range of 6.7-9.4 per cent annually for production.

27. The average annual rate of growth in steel consumption was 3.2 per cent from 1964 to 1974 in Western Europe, 2.3 per cent in the United States and 4.5 per cent in Oceania, but it was 7.5 per cent in Latin America, 7.7 per cent in Africa, 18.0 per cent in the Middle East and 7.3 per cent in the Far East. This implies continued expansion in developing country steel imports even as their production grows dramatically. Crude steel imports of the developing countries have been increasing rapidly - from $1.6 billion in 1967 to $5.1 billion in 1973; in addition the developing countries imported steel contained in capital equipment and other manufactures of about the same amount as the direct steel imports. Developing country crude steel imports are estimated by UNIDO to grow to $26.2 billion by the year 2000 if the Lima targets are to be attained.

28. World exports of semi-finished and finished steel reached a peak of 1 122.3 million tons in 1974, fell by 13 per cent in 1975, recovered in 1976 but still remained 6 per cent below the level reached in 1974. The geographic pattern of world trade in iron and steel (based on value data) is shown in Table 2 for the years 1971 to 1975. The effects of the recession in developed market-economy countries are demonstrated by the decline of the share (in world steel trade) of imports into these countries from 62 per cent in 1973 to

52 per cent in 1975. The share (in world steel trade) of imports into OPEC countries increased dramatically from 5 per cent in 1972 to 12.5 per cent in 1975. As can be seen from the table, developing countries remain marginal exporters, accounting for only some 2 to 3 per cent of world steel exports.

29. In the absence of trade data in terms of tonnages which can be compared with the production figures, only a very crude estimate of changes in developing countries' import dependence can be made. Thus net imports accounted in 1972 for about 35 per cent of steel availabilities in developing countries but for about 45 per cent in the years 1975 and 1976. This change appears to be largely due to the rising steel consumption in OPEC countries. Among these countries only Algeria and Venezuela have so far established a steel industry. These two countries are currently planning and executing massive additions to their steel making capacities. Iran and also other OPEC countries are likewise in the process of establishing a steel industry. In developing countries other than members of OPEC the dependence on imports for domestic steel requirements has not changed much during the past 5 years. Between 1955 and 1970 production of steel in developing countries (as a whole) increased significantly faster than consumption with the effect that the share of imports in consumption declined from about 75 per cent to about 40 per cent.

30. World steel trade in general has thus grown substantially in recent decades. Exports have grown from 34 million ingot tons in 1955 to 145 million ingot tons in 1973; as a percent of world steel production, this represents a rise from 12.6 to 20.8 per cent. This trade growth has been accompanied by some remarkable shifts in trade patterns as well. Most important of these is the emergency of Japan as the most competitive of international suppliers of steel - the pace-setter in efficiency, technology, economies of scale, production cost, and quality of service in export markets. Japan has made inroads on third-country steel markets at the expense of the major European and American steel firms, as well as dramatically expanding shipments to their own home markets. Traditionally, the countries of the European Coal and Steel Community had a dominant position in world steel trade. Today they have been displaced by Japan, which alone is responsible for over one fourth of world trade in steel. At the same time, developing-country suppliers in countries like the Republic of Korea have also been gaining in competitiveness, and have been following the Japanese lead in the international steel markets. These shifts in trade and competitiveness, in turn have led to growing interdependence of markets. There are now four segments of the world steel industry that need to be examined jointly: Western Europe, Japan, the United States and the developing countries. What happens in any one of these will invariably affect each of the others. Each faces problems that can be resolved, in part, only at the expense of the others.

Table 2

World trade in iron and steel (SITC 67), 1971 to 1975

(Percentages based on value of world steel trade)

| Exports to / from | | Developed market economy countries | OPEC | Developing countries Excl. OPEC | Socialist countries of Eastern Europe | World |
|---|---|---|---|---|---|---|
| Developed market economy countries | 1971 | 59.9 | 4.2 | 12.8 | 6.8 | 83.7 |
| | 1972 | 60.0 | 4.5 | 11.6 | 7.1 | 83.2 |
| | 1973 | 57.0 | 5.3 | 13.3 | 9.6 | 85.3 |
| | 1974 | 53.8 | 8.0 | 16.2 | 10.3 | 88.3 |
| | 1975 | 48.1 | 11.6 | 14.1 | 12.6 | 86.5 |
| Developing countries | 1971 | 1.2 | 0.2 | 0.8 | 0.2 | 2.4 |
| | 1972 | 2.0 | 0.3 | 0.9 | 0.2 | 3.4 |
| | 1973 | 1.7 | 0.5 | 1.0 | 0.1 | 3.4 |
| | 1974 | 2.0 | 0.4 | 1.0 | 0.1 | 3.4 |
| | 1975 | 1.3 | 0.6 | 0.8 | 0.1 | 2.7 |
| Socialist countries of Eastern Europe | 1971 | 3.3 | 0.4 | 1.4 | 8.7 | 13.9 |
| | 1972 | 3.0 | 0.3 | 1.4 | 8.7 | 13.4 |
| | 1973 | 2.9 | 0.3 | 1.0 | 7.1 | 11.4 |
| | 1974 | 2.4 | 0.3 | 0.9 | 4.6 | 8.3 |
| | 1975 | 2.2 | 0.4 | 0.8 | 7.3 | 10.7 |
| World | 1971 | 64.5 | 4.7 | 15.0 | 15.7 | 100.0 |
| | 1972 | 65.0 | 5.1 | 13.9 | 15.9 | 100.0 |
| | 1973 | 61.6 | 6.2 | 15.3 | 16.8 | 100.0 |
| | 1974 | 58.1 | 8.7 | 18.0 | 15.0 | 100.0 |
| | 1975 | 51.6 | 12.5 | 15.7 | 20.0 | 100.0 |

Source: United Nations Monthly Bulletin of Statistics, May 1977, Special table C.

31. The late 1970's are an especially sensitive time for the world iron and steel industry, and the emerging role of the developing countries in particular became more apparent. The immediate problem for the steel industry of the developed market-economy countries is demand recession and lagging recovery. In essence, global steel capacity has been built on the basis of rapid expected growth in demand that did not materialize, and particularly Japan and Western Europe built steel capacity with major exports markets in mind. As figure 3 shows, steel demand has grown roughly in line with the growth of gross product, but expansions and contractions in the iron and steel sector have been amplified by the accelerator-effect. Accordingly, the mid-1970's recession produced a collapse of capital goods construction after 1974 - the product of over-expansion in previous years, rapid inflation and the increased energy costs - which in turn led to a collapse of steel demand in 1975 from which the industry has yet to recover.

32. Second, the "overcapacity" problem is also the result of substantial additional steelmaking facilities, built partly in response to the boom years in steel demand and partly under growing international competitive pressures forcing national steel firms to develop new and more efficient plants. At the same time, the incremental capacity was not accompanied, for various reasons, by the retirement of older and less efficient plants. As a result, the industry has become "sensitive" and, barring another major boom in steel demand, will remain so for the foreseeable future. Even if such a boom comes about and eliminates the "overcapacity" problem for a time, it is likely to re-emerge before very long.

33. Finally, there are structural problems as well. Because of steadily growing demand in the post-war period, together with a largely oligopolistic market structure and poor short-term intermaterial substitution possibilities, much of the steel industry in the United States and Western Europe has emerged with overpaid labour and overvalued capital assets, together with technological obsolescence in major parts of the industry.

34. A report by the UNCTAD secretariat in 1977 examined in some detail the steel industry from the standpoint of international trade and achievement of the Lima targets. 5/ That report assessed international trade in iron and steel with specific reference to the role of developing countries, particularly the advantages they may derive from forward-processing of indigenous iron ore deposits, foreign exchange savings that may ensue, tariffs, non-tariff and transport costs barriers as obstacles to export-oriented development of the iron and steel industry in developing countries, as well as cartel activities and other industrial organization barriers that may be encountered.

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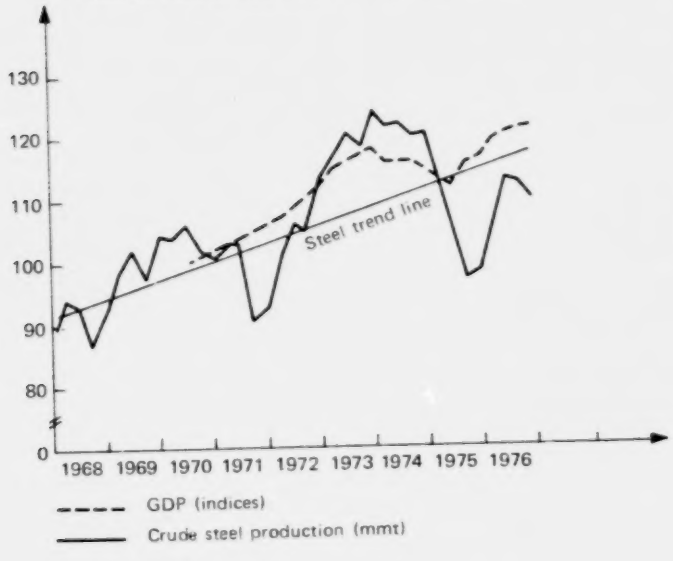
5/ "Improving the capability of the developing countries to supply exports of manufactures and semi-manufactures: The iron and steel industry". (TD/B/C.2/176).

**Figure 1**
**Crude Steel Production**
**and GDP Growth, 1968 to 1976**

million metric tons and indices, 1970 = 100




*Source: UNIDO*

35. It is not the purpose of this document to repeat what has already been stated in that report, or in several recent documents prepared by the secretariat of UNIDO. 6/ Rather, it is to analyse in some depth the market access problems faced by emerging developing-country steel suppliers, with emphasis on the new protectionism deriving from the depressed condition of the industry in the mid-1970s. Against this background, the supply problems faced by developing countries are briefly discussed. Finally, the report discusses a number of policy options that may be available to the developing countries in securing adequate access to international iron and steel markets.

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6/ Problems and Opportunities in the World's Iron and Steel Industry. Vienna: UNIDO/IOD 50, 22 November 1976. "Consultation Meeting on the Iron and Steel Industry: Background and Supporting Information on issues which might be selected at the consultation meeting", Vienna: UNIDO (ID/WG.241/1 and Corr.1), 25 November 1976.

## II. ACCESS TO MARKETS

36. Access to export markets will in part determine the success of developing countries in establishing iron and steel industries of competitive size, and hence the feasibility of the Lima target in this sector. Market access is largely defined by the formal trade restrictions that exist - tariffs and non-tariff import barriers. Additionally, it depends on informal measures imposed by governments or enterprises in the iron and steel industry which may impede the entry of new suppliers from the developing countries. Unfortunately, in both areas it appears that trade restrictions faced by developing-country exporters are already formidable and are likely to become even more so in the near future.

37. This section briefly surveys tariff and non-tariff trade barriers that have traditionally impeded market access for developing country suppliers. It then analyses the origins of new pressures for protection in three main iron and steel producing and consuming areas: the United States, the European Economic Community and Japan. This is the setting against which the supply side must be examined and which, ultimately, underlies the probable direction of change in international iron and steel trade, especially since almost half of developing country exports in this sector have traditionally entered these three markets.

### Tariffs

38. As in most sectors, tariffs in the iron and steel industry, in developed market-economy countries are highly escalated yielding high rates of effective protection for finished manufactures. Table 3 presents average nominal tariffs levied on iron and steel products in the above-named countries, which constitute almost the entire developed-country market for developing country iron and steel exports. Raw materials are generally admitted duty-free, with moderate tariffs imposed on semi-manufactures and high tariffs levied on manufactures. Tariff escalation is relatively greater in the United States than in the EEC and Japan, thus indicating higher rates of protection. However, as noted below, tariffs may not give a very good insight into problems of market-access, especially in Japan. Moreover, recent developments may very well relegate tariffs in general to relative unimportance in the future, as new approaches to protection are implemented in all three areas.

39. On the other hand, developing country exporters of iron and steel do benefit from tariff preferences in each of the main developed-country markets under the GSP. Most iron and steel products thus enter the developed market-economy countries on a duty-free basis. However, the United States imposes a $25 million "competitive need" limit on imports of any single item from a given GSP beneficiary country (or 50 per cent of total United States imports, whichever is less) after which the MFN tariff rate applies permanently, unless removed by presidential decision. Japan and the EEC also impose maximum yearly import levels, from developing countries as a group and from any single supplier, and the tariff reverts to the MFN rate when these are exceeded. Such quantitative limits may cause a high degree of uncertainty on the part of developed country importers and developing country suppliers, and - together with strict rules of origin applied to eligible products and the indeterminate duration of the GSP itself -

Table 3

Average nominal tariffs on selected iron and steel products by stage of processing: EEC (1972); Japan (1972); United States (1974)
(per cent)

| Stage of processing | EEC | Japan | United States |
|---|---|---|---|
| Raw materials | 0.0 | 0.0 | 0.0 |
| Semi-manufactures | 6.6 | 7.4 | 6.2 |
| Finished manufactures | 8.7 | 9.9 | 12.2 |

Source: UNCTAD secretariat calculations.

substantially reduce the impact of the GSP in the iron and steel sector. 7/ Given the capital and other resources needed to create a viable steel industry in a developing-country context, the uncertainties associated with the GSP in its present form remain a major source of difficulty. Moreover, the future usefulness of the GSP in the iron and steel sector must be considered in the light of prospective developments affecting major importing countries' markets, as discussed below.

Non-tariff barriers

40. While it is still too early to make a definitive statement as to their specific nature, there is at present little doubt that non-tariff barriers (NTBs) will form the principal future hindrance to export-oriented industrialization in the iron and steel industry for the developing countries. The emerging set of NTBs that are likely to bring this situation about will be discussed in connexion with the analysis of the United States, EEC and Japanese markets.

41. The aforementioned UNCTAD study surveyed non-tariff barriers facing international trade in steel in the early 1970s in the principal developed market economy countries - see table 4. These cover (a) specific trade-related devices such as quotas and import surcharges; (b) administrative measures such as marketing regulations and customs valuation; (c) internal policies that discourage steel imports, such as price controls and discriminatory tax measures; and (d) restrictive business practices of firms in the industry, especially cartel-formation, and by suppliers and purchasers in other industries, e.g. discriminatory freight rates.

42. It is difficult or impossible to estimate the trade-restrictive effect of this complex web of NTBs applying to the iron and steel sector. That they have a significant negative effect on imports into the countries applying them is, however, a virtual certainty. For example, import quotas on specialty steel applied by the United States in 1976, preceded by "voluntary" export restraints dating from 1969 until 1974 and applied to Japanese, Canadian and western European exporters, clearly had a trade-restrictive effect. So did the anti-dumping activity that occurred during 1977. In the EEC, Japanese "voluntary" export restraints applied in 1975 seem to have had a similar effect, and in addition diverted Japanese shipments to the United States. And the minimal levels of Japanese imports of steel, in addition to reflecting the competitiveness of Japan's home industry, certainly reflect the restrictive effects of that country's NTBs. These points will be discussed in greater detail below. It is sufficient to note at this point that NTBs will continue to represent the principal constraint on developing country access to the major markets for iron and steel.

Government subsidies and intervention

43. A third general set of impediments to market access facing developing countries is direct or indirect government intervention in the domestic iron and steel sectors in principal export markets, thus making the import-competing sector better able to drive back supplies from abroad. Governments may provide the domestic steel industry with preferred access to capital loans and other credits at concessionary terms permitting a reduction in fixed costs and modernization of plant and equipment that would not otherwise be possible. Or governments may

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7/ However, the 52 developing countries associated with the EEC under the Lomé Convention in the African, Caribbean and Pacific regions (ACP) have duty-free access to the EEC market for products manufactured in any ACP countries.

Table 4

Non-tariff barriers facing steel imports

| | Belgium | Canada | France | Germany, Fed.Rep.of | Italy | Japan | Luxembourg | Netherlands | United Kingdom | United States |
|---|---|---|---|---|---|---|---|---|---|---|
| **Foreign trade policies** | | | | | | | | | | |
| Import licences | | | | | | x | | | | |
| Exchange controls | | | x | | | x | | | | |
| Quotas | | | x | | | | | | | |
| Export limitations | | | | | | | | | | x |
| Biased procurement | x | x | x | x | x | x | x | x | x | x |
| Transport rebates | x | | x | x | x | | x | x | | |
| Wage tax rebates | | | x | | | | | | | |
| Marketing assistance | x | x | x | x | x | x | x | x | x | x |
| Tied foreign aid | | | x | | | | | | | x |
| Indirect tax rebates | x | | | x | x | | x | x | x | |
| Import surcharges | | | | | | | x | | | |
| Anti-dumping laws | | x | | x | | | | | | x |
| **Administrative practices** | | | | | | | | | | |
| Advertising rules | | | | | | | | | | |
| Marketing regulations | | | | | | | | | | x |
| Document requirements | x | x | x | x | x | x | x | x | x | x |
| Classification rules | x | x | x | x | x | x | x | x | x | x |
| Valuation procedures | x | x | x | x | x | x | x | x | x | x |
| Customs fees and deposits | | | x | | x | x | | | x | |
| Other customs rules | x | x | x | x | x | x | x | x | x | x |
| Penalties | x | x | x | x | x | x | x | x | x | x |
| **Internal policy and regulation** | | | | | | | | | | |
| Direct payments | x | | | | | | | | x | |
| Depreciation | x | x | x | x | x | x | x | x | x | x |
| Investment incentives | x | | x | | x | x | x | x | x | x |
| Low-cost loans | | | x | x | | x | | | | |
| Overpriced purchases | | | x | | | | | | | |
| Internal tax rebates | | | | | | | | | x | |
| Direct taxes | | | | | | | | | | |
| Indirect taxes | x | x | | | x | | | x | | |
| Price controls | x | | x | x | x | x | x | x | x | x |
| Credit controls | | | | | | | | | | |
| Advertising rules | | | | | | | | | | |
| Patents and trademarks | | | | | | | | | | |
| Health and safety rules | | | | | | | | | | |
| Technical specifications | | | x | | | | | | | |
| National security rules | | | | | | | | | | |
| **Private practices** | | | | | | | | | | |
| Cartels | x | x | | x | x | x | x | x | x | x |
| Exclusive supply agreements | x | | x | x | x | x | x | x | x | x |
| Freight-rate discrimination | | | | | | x | | | | |

Source: C. MacPhee, Restrictions on International Trade in Steel (Lexington, Mass., Heath & Co., 1974)

provide favourable tax treatment in various ways such as accelerated depreciation and tax credits for investments in plant and equipment. Governments may also contribute equity capital with similar effects, or the industry may be nationalized and run at a loss, representing an effective subsidy from general fiscal resources.

44. Beyond this, government involvement has sometimes favoured the domestic steel industry as well. Included are exemption from anti-pollution requirements, occupational health and safety requirements and other regulations which, while desirable, involve significant cost-increases and competitive disadvantages to the industry.

45. Governments may also condone or encourage the formation of cartels in the industry which, aside from price-maintenance and market-sharing, may also apply on an international level as in the European Coal and Steel Community, where in times of crisis the High Authority is empowered to mandate cartel-type practices within the EEC iron and steel sector. Presently, the creation of Eurofer will, if it is ultimately successful, foster far-reaching cartelization in the European steel industry. Recent moves in the United States have sought to exempt the iron and steel industry from federal anti-trust statutes to permit joint ventures among steel firms in order to encourage steelmaking facilities of greater efficiency. In Japan, mergers among firms in the iron and steel industry into a highly oligopolistic competitive structure have re-established to some extent the pre-war concentration of market power. Four cartels control Japanese exports of a wide variety of steel products. Exemptions under the Antimonopoly Act which permit "depression cartels" and "rationalization cartels" have left the door open for creation of steel cartels in the domestic market as well.

46. Besides the trade-restrictive effects that cartels may have on developing country exports to the major developed economy markets, they may have a serious bearing on competition in the developing countries themselves and in third-country markets. Even if developing-country suppliers are able to compete effectively on economic grounds, the pricing policies and other restrictive measures of export cartels may well prevent this from materializing.

47. To conclude, whereas tariff escalation in the iron and steel sector has the standard negative trade effects on the developing countries - tending to locate the higher value-added activities in the advanced countries by elevating effective rates of protection - tariffs are a relatively small part of the market-access problem. This is especially true when the eligibility of iron and steel under the Generalized System of Preferences is considered, despite drawbacks related to quantitative limits on eligible shipments and rules of origin requirements. The real problem lies in the realm of non-tariff trade barriers attributable to internal problems in the developed market-economy countries related to deficient demand and structural adjustment. These problems in the United States, the EEC and Japan are discussed below, with specific reference to the depressed economic condition of the mid-1970's out of which a serious threat of protectionist pressures has emerged which may well prevent market access for developing country steel exporters on a virtually permanent basis.

## A. The United States

### Demand, output and employment

48. The slowdown in economic activity in the mid-1970s and the slowness of the subsequent recovery have critically affected the United States iron and steel industry. In the United States, the steel sector has been characterized by severe recessionary conditions caused by both macroeconomic factors and structural conditions in the industry. Referring to 1975 data, demand for new orders amounted to $35.8 billion, representing a sharp decline of $13.1 billion or 26.8 per cent from the previous year. 8/ Total steel deliveries also fell by 28.0 per cent or 24.6 million tons. The drastic decline in steel deliveries was due to a drop in demand and heavy destocking at all levels of consuming sectors. The stock depletion in the steel consuming industries and distribution centres was estimated at about 8 to 10 million tons.

49. The reduced demand for steel originated from all of the major steel-consuming industries. Construction activity in the United States declined by 15 per cent from 1974 to 1975, while the decline in steel deliveries to that sector amounted to 6.9 million tons or 32.8 per cent. The automotive industry experienced a difficult period as well, and passenger car output in 1975 was 9 per cent less than in 1974 and 31 per cent less than in 1973. As a result of the reduced demand in the automotive industry, steel deliveries to that sector in 1975 declined by almost 3.4 million tons or 20.0 per cent. Deliveries to manufacturing industry were also reduced by 3.3 million tons or 25.8 per cent. Steel exports experienced the greatest decline - 2.0 million tons or 60 per cent although they amounted to only about 4 per cent of total United States demand for steel.

50. The slowdown in demand for steel products in almost all main consuming sectors caused a drastic decline in steel production. Overall steel output amounted to 106 million tons during 1975, representing a decline of 26 million tons or 19.7 per cent below the previous year. Despite general economic recovery in the United States, by late 1977 the industry's demand picture had still not returned fully to pre-recession levels in all sectors.

51. Total employment in the iron and steel industry declined by 10,000 or 2 per cent in 1975. On the other hand, the monthly average number of hours worked per employee declined by 23 hours or 13.9 per cent. In addition the index of annual crude steel output per employee declined by 20 per cent. In 1977, major layoffs of production workers were announced by a number of United States steel firms and a variety of mills were permanently closed. These included Bethlehem Steel Corporation (7,300), Lykes Corporation (5,000) and United States Steel (1,200). Total job losses were estimated as high as 60,000 on a base level of something over 470,000 total. Steel imports greatly exceeded exports, and have been relatively erratic during the 1971-77 period. In 1977 they reached approximately 20 million tons. Japan and the EEC are the principal suppliers of imports to the United States.

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8/ Note: All data are derived from United Nations Economic Commission for Europe, The Steel Market in 1975 (United Nations publication, Sales No. E.76.11.E.13); OECD, The Iron and Steel Industry in 1975 (Paris: OECD, 1977); and International Iron and Steel Institute, Annual Statistical Report, 1975 (Brussels: AISI, 1976).

Table 5

United States production, consumption and trade in steel, 1971-1975
(thousand metric tons)

| Year | Production | | | Imports | | | Exports | | | Consumption | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Thousands of tons | Change | | Thousands of tons | Change | | Thousands of tons | Change | | Thousands of tons | Change | |
| | | Quantity | % | | Quantity | % | | Quantity | % | | Quantity | % |
| 1971 | 109 055 | - | - | 21 198 | - | - | 2 590 | - | - | 127 663 | - | - |
| 1972 | 120 750 | +11 695 | +10.7 | 16 040 | -5 158 | -24.3 | 2 631 | + 41 | + 1.6 | 138 410 | +10 747 | + 8.4 |
| 1973 | 136 462 | +15 712 | +13.0 | 13 744 | -2 296 | -14.3 | 3 708 | +1 077 | +40.9 | 149 595 | +11 185 | + 8.1 |
| 1974 | 131 992 | - 4 470 | - 3.3 | 14 488 | + 744 | + 5.4 | 5 343 | +1 635 | +44.1 | 144 120 | - 5 475 | - 3.7 |
| 1975 | 105 945 | -26 047 | -19.7 | 10 897 | -3 591 | -24.8 | 2 778 | -2 565 | -48.0 | 116 821 | -27 299 | -18.9 |

Source: United Nations Economic Commission for Europe, The Steel Market in 1975, (ECE/Steel/15).

Plant and equipment

52. Despite the recessionary conditions in the United States iron and steel industry in 1975, steel enterprises continued to invest moderately in modernizing and expanding the existing facilities and adding new capacity. Capital expenditures in 1975, for example, amounted to $3.3 billion, representing an increase of $11.2 billion or 56.3 per cent over 1974. According to a report prepared under contract to the United States Department of Commerce, United States crude steel capacity will reach 160 million tons by 1980. This would represent an expansion of about 25 million tons over current levels, a capital outlay approaching $22 billion. The overall capital needs of the iron and steel industry are, however, substantially higher since about 18 million tons of plant needs replacing and a great deal of pollution control equipment has to be added to existing facilities. A report prepared by the Science and Technology Committee of the House of Representatives came to the conclusion that the principal barrier to innovation in the steel industry is its high costs, and that government action to underwrite some of these costs would be justified in view of the industry's important contribution to the economy.

53. Most of the plants being phased out by the United States steel industry during 1977 were old and inefficient and thus for the most part internationally uncompetitive; many would be extremely difficult to bring up to new environmental standards without extensive capital outlays. Several United States steel firms have streamlined their production mixes to get out of product lines where there is no possibility of competing with imports - for example, Kaiser Steel dropped out of structural steel production entirely.

Pig iron and raw material markets

54. The setback in the steel industry clearly had an effect on the pig iron and raw materials sectors. Total pig iron consumption continued to decline during 1975 by 14.2 million tons or 16.7 per cent. Production registered about the same decline of 14.5 million tons or 16.7 per cent compared with 1974. Total exports of pig iron declined by 26 thousand tons or 14.3 per cent, while imports increased by 93 thousand tons or [illegible] per cent between 1974 and 1975. The larger increase came from Japan and amounted to 168 thousand tons in 1975, which was about four times greater than the level in the previous year.

55. The raw materials market also showed a downturn in 1975 due to unfavourable conditions in the steel and pig iron market. Total iron ore consumption and production declined in 1975 by approximately 6.6 million tons (5 per cent) and 5.1 million tons (6 per cent), respectively. United States iron ore exports increased in 1975 by 217 thousand tons or 9.2 per cent, mainly to non-European OECD countries. Imports of iron ore declined from 48.8 million tons in 1974 to 47.5 million tons in 1975, representing a fall of 1.3 million tons or 2.7 per cent. The second major raw material used in the iron and steel industry, ferrous scrap, also indicated a setback in 1975. Scrap consumption declined by 17 million tons or 21.5 per cent from 1973 to 1975, while domestic supply was reduced by 10.3 million tons or 18.7 per cent. Exports of ferrous scrap, on the other hand, increased by 839 thousand tons or 10.5 per cent, while imports increased by 96 thousand tons or 52.7 per cent. Consumption, production exports and imports

of coke all declined in 1975. Total coke consumption dropped by 8.9 million tons or 16.5 per cent, production declined by 3.9 million tons or 7 per cent, while exports and imports declined by 0.4 and 48.6 per cent respectively.

Price trends and cost of production

56. In the United States domestic steel prices tended to increase during 1975 despite a weak market. The finished-steel price index of the Bureau of Labor Statistics increased during 1975 by 9.6 points, representing an actual increase of 5 per cent. Prices of virtually all steel products were increased during the first half of 1975 while they remained constant throughout the second half. These price increases reflected an overall higher cost of production. An exception to the general increase in the cost of the principal factors of production was the price of iron and steel scrap which showed a decline of 30.5 per cent during 1975. But wages went up by 16.7 per cent, coking coal by 14 per cent, coke by 33.5 per cent, fuel oil by 2.1 per cent (after more than doubling 1973-74), electric power by 18.6 per cent and iron ore by 25.1 per cent, compared with 1974.

Competitive position of the industry

57. Relative to its major European and Japanese rivals, the United States steel industry has done poorly in a competitive environment, despite the fact that there is no apparent fundamental reason why the United States should have a significant international comparative disadvantage in steelmaking. Yet in relative terms capital formation in the industry has been sluggish in recent decades. A comparatively large proportion of existing plant and equipment is obsolescent. Major innovations in steelmaking have been slow in coming, or have first been applied abroad. Productivity growth has been slow, and demand has been relatively stagnant (except for cyclical swings), as competing materials have made significant inroads on traditional markets for steel. Particularly in the automobile industry - a major steel user - a general move away from steel is likely to grow rapidly as part of an effort to make cars lighter and more fuel-efficient.

58. Both Japanese and European steel producers maintain relatively close links with their governments, through direct ownership, through the banking and credit system or through various types of public-sector aids. This means that adequate funds for the expansion and modernization of steelmaking capacity are relatively easily accessible. In the United States, however, such expenditures either have to be financed through retained earnings or by recourse to private financial markets. In a period of depressed industry conditions, made worse by severe import competition, neither of these avenues has been readily available. If the underlying trade problem is obsolescence and inefficiency of steelmaking capacity, then an absence of governmental aids can render the nation's competitive disadvantage correspondingly more severe.

59. In spite of these generally pessimistic conditions, the steel industry in the United States has granted wage increases that are difficult to justify on economic grounds. Firms have traditionally given in to union wage demands with relatively little resistance, relying on an oligopolistic market structure to permit a speedy pass-through of wage-cost increases onto the prices of steel products. For example, major United States steel companies have recently negotiated costly

lifetime job security for members of unions. Despite periodic government scrutiny of steel-industry price increases, the results inevitably made it easier for foreign mills to compete in the United States market, and have further encouraged the substitution of other materials for steel in a wide variety of user-industries.

60. The poor record of United States steel firms in meeting foreign competition goes back at least as far as the depression of the 1930s, when the industry complained about the inroads of cheap foreign steel. Governmental incentives and the recovery of demand with the coming of World War II notwithstanding, the industry at that time refused to risk its own capital on new plant and equipment until the Government agreed to bear the entire cost of defence-related plants as part of the wartime mobilization effort.

61. Available production cost and efficiency comparisons between the United States and Japanese steel industries indicate a strong competitive disadvantage based on the aforementioned technological backwardness and obsolescence, and inflated wage costs, the product of decades of poor management and complacency. Meanwhile, foreign steel firms have greatly improved their supply capabilities. For example, many foreign steel firms have now established "service centres" in the United States, currently about 80 in number, which are used to provide customers the same standard of service that domestic manufacturers are able to supply.

Pressures for protection

62. In the light of its severe structural and competitive problems, it is logical that the United States steel industry would attempt to obtain protection against imports, and it has regularly done so except in boom periods that brought full utilization of capacity and high prices.

63. In the late 1960s the industry was able to obtain protection through voluntary export restraints (VERs), which arguably succeeded in limiting imports until they were abandoned during the 1974 boom in steel demand. While they were in force, there is some evidence that the VERs were subject to erosion as a result of transshipment of steel via third countries and substitution among categories of products within aggregate VER limits. The American Iron and Steel Institution has expressed the view that Japanese steel has in the past found its way into the United States market via the Philippines and the Republic of Korea despite formal or voluntary import restrictions.

64. Specialty and tool steel producers in the United States obtained protection in the form of import quotas in 1976. Imports of specialty steel had shown rapid growth in the 1960s and early 1970s, attaining a 60 per cent share of some markets by 1975. Early in 1976 the International Trade Commission (ITC) ruled in favour of the industry and the United Steelworkers Union under Section 201 of the Trade Act of 1974 and recommended five-year import quotas limiting foreign suppliers' market shares on a product-by-product basis. In its ruling, the ITC accepted the industry allegation that foreign suppliers were selling at a loss. Nevertheless, the ITC recommendation was rejected by the Ford Administration in favour of an import ceiling of 147,000 tons for 1976, 5 per cent lower than 1975 import tonnage. The quota was subject to a 3 per cent annual growth factor. In June 1977 President Carter ordered the specialty steel quotas re-examined. To date, however, they remain in force.

65. A recent study of steel import restrictions in the United States has estimated the effects on the domestic steel industry of trade liberalization. 9/ The restrictions in question were a 7 per cent average tariff rate and voluntary export restraints on carbon steel agreed to by Japan and the EEC during the period 1969-1973. The study finds that the removal of both restrictions would not have led to a sudden decline in United States steel output, and that import penetration would have built up gradually to about 8 per cent over four years. Employment would have declined proportionally more than output because the oldest, least efficient, most labour-intensive mills would have been affected most heavily. Some layoffs would have occurred, but the major part of the employment reduction would have taken place through attrition. Layoffs would have averaged less than 5 per cent of the labour force over a five-year period, with each displaced worker losing $6,000 in lifetime earnings. Industry profits would have declined, and would have been eliminated in the year of the greatest effect. On the other hand, steel-using industries would have gained substantially in the form of lower prices, as would consumers, and the study concludes that these gains would have more than offset the losses to the domestic industry and its workers.

66. The United States Administration was under intense protectionist pressure from domestic steel interests throughout 1977. Although it preferred not to resort to import controls, there was clearly the threat that steel firms and associated labour groups would appeal directly to Congress, which has recently looked sympathetically on protectionist interests in various sectors. Several bills were introduced in the Congress in 1977 calling for drastic cuts in steel imports by means of quantitative restrictions. For example, a bill sponsored by Representative Lawrence Caughlin called for a roll-back of imports to their 1975 levels of 12 million tons. During the summer of 1977 the United States steel industry sought to have the President exercise his authority under the 1974 Trade Act to reduce via quotas Japanese imports by the amount (8.7 million tons) the industry claims was re-directed to the United States from Europe as a result of restrictions applied in the latter market. Meanwhile, the domestic steel companies sought to stem the flow of steel imports through vigorous use of the anti-dumping provisions of the Trade Act of 1974.

67. In October 1977 the Treasury found in a preliminary ruling that five Japanese companies were dumping carbon steel plate and recommended that substantial anti-dumping duties be imposed - 32 per cent ad valorem, as compared with the prevailing MFN duty of 7½ per cent. Although a 90-day period was provided for additional hearings, importers were required to post bonds of 32 per cent on the declared value of the imports. The Treasury finding of dumping was a relatively narrow one based on a complaint by the Gilmore Steel Corporation. In September 1977 the United States Steel Corporation filed much broader anti-dumping charges covering nearly $2 billion of United States steel imports from Japan. At about the same time, the Georgetown Steel Corporation lodged a similar complaint against a group of French steel exporters. Overall, United States steel firms have filed over 20 petitions alleging dumping on the part of foreign suppliers. Indeed, the Carter Administration had urged the domestic steel industry to use all remedies available under the anti-dumping statutes to seek redress of unfair trade practices. It assured the industry that the principles of "fair" trade would be strictly enforced.

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9/ James H. Jondrow, "Effects of Trade Restrictions on Imports of Steel", United States Department of Labor, Bureau of International Labor Affairs, Washington, D.C., December 1976 (mimeo.)

68. An important aspect of United States anti-dumping provisions as contained in the Trade Act of 1974 is the unusual definition of "dumping". The conventional definition under GATT involves selling abroad at prices lower than at home. The 1974 Trade Act, on the other hand, defines dumping as selling abroad at prices insufficient to cover all production costs plus an 8 per cent profit margin and a 10 per cent markup for general expenses, regardless of what price is charged in the home-country market. As a result, dumping margins tend to be substantially wider than under the conventional GATT definition. It is this statute, despite its radical departure from international convention, that the United States Administration urged domestic steel firms to make use of in order to obtain protection from "unfair" import competition. A further difficulty in applying this form of anti-dumping protection is that very few cost data are not regarded as confidential, forcing reliance on "constructed" values purporting to represent real costs.

69. Some estimates are that if the 1974 anti-dumping statute were enforced to the letter, it could reduce imports of carbon steel into the United States from Europe, Japan and the developing countries by as much as one-half. Moreover, action under the anti-dumping statute would technically be in violation of the GATT, and could trigger formal complaints against the United States from affected foreign suppliers. The finding of dumping in the Gilmore case against Japanese mills and the requirement to post a 32 per cent bond did lead to a substantial resurgence of orders going to domestic mills. The bond itself, and the uncertainty as to the outcome of other anti-dumping cases, led to a pullback both on the demand side and by the Japanese suppliers. However, there was considerable evidence that steel firms in the Republic of Korea and certain other developing countries were aggressively going after the markets lost by the Japanese. Estimates were that developing-country suppliers were underbidding Japanese mills by 10-20 per cent before the Gilmore decision.

70. There was considerable evidence that many United States steelmakers viewed anti-dumping actions primarily as a lever to obtain agreement from foreign steel suppliers to negotiate an international safeguard and/or market-sharing arrangement. Furthermore, at the end of 1977 the Administration itself had pulled back from its advocacy of anti-dumping complaints by the steel industry, instead proposing alternative forms of protection, as discussed below. Meanwhile, the International Trade Commission in 1977 initiated an investigation of its own into Japanese pricing practices favouring certain customers over others. The Japanese have allegedly acquired shares in United States firms that are in competition with their own downstream customers manufacturing wire, nails, tubes and similar products. And in late 1977 the staff of the International Trade Commission, independent of any actions being taken by the Treasury or other agencies, charged that 32 European steel firms were engaged in unfair trade practices in the United States market. Specifically, they were charged with selling below cost, 50-66 per cent below United States firms' prices, and offering long-term supply contracts at specified margins below domestic prices. Section 337 of the 1930 Trade Act, as amended by the 1974 Trade Act, gives the ITC the power to carry out its own investigations of unfair competition, to order offending firms to cease and desist, and even to exclude all imports from offending firms. The duplication of jurisdiction between the Treasury and ITC created conflict within the Government, and particularly threatened to disrupt a co-ordinated effort to aid the domestic steel industry - see below.

Protection and restructuring

71. Since it is clear that fundamental restructuring and modernization provides the only long term solution for the United States steel industry, and since restructuring will take time, it is likely that future developments will involve significant protection - which may either prove to be permanent in nature, or interim in order to facilitate a competitive steel sector. An example is a proposal in 1977 by Representative Charles A. Vanick for a "national steel policy" which would roll back imports to 18 per cent of the United States market via temporary quantitative restrictions, with one-third of imports assigned to Japan, one-third to Western Europe, and the remaining third to other suppliers. This would be a prelude to a broader international safeguard arrangement for steel, to be negotiated later.

72. An interagency group was established by the Carter Administration in 1977 to help modernize the United States steel sector. Loan guarantees of $215 million are to be released from a revolving fund to aid firms in depressed areas and with few prospects for private financing for modernization purposes - to be administered by the Commerce Department in support of over $1 billion in loans. The burden of environmental regulations affecting the steel industry is to be alleviated. Accelerated depreciation and other tax incentives for new plant and equipment are provided. The plan involves a reduction in the life of steelmaking equipment for tax purposes from 18 to 15 years, adding $18 million to the industry's cash flow in 1978 and $90 million in 1982. It also includes expanded trade adjustment assistance (especially to hard-hit communities), adjustment of rail freight rates to reduce the cost of domestic steel shipments, and easing of anti-trust restraints to permit joint ventures between various steel firms for purposes of promoting greater efficiency and economies of scale.

73. In order to justify such special treatment, the United States steel industry spokesmen have pointed to the Marshall Plan and other forms of post-war economic assistance to Europe and Japan as being partly responsible for the superior efficiency of foreign mills. They rarely mention the fact that the majority of United States mills constructed during World War II were financed by the Government and later sold to private companies at a fraction of their original cost.

74. A key recommendation of the interagency task force was establishment of a "sluice-gate" system to guarantee minimum import prices, also called a "reference price" system. This involves "trigger" or "floor" prices covering major steel import categories. Foreign steel may be sold in the United States market at or above the reference prices. Imports priced below these levels will be subject to a "fast track" Treasury anti-dumping investigation, with dumping findings possible in 60-90 days and anti-dumping duties imposed retroactively. Administration is by government monitoring of importers' invoices at the dockside. Importers are not notified at the time of customs clearance of the possibility of retroactive anti-dumping duties.

75. The initial reference prices were announced in January 1978 for 17 steel categories, and averaged $330 per ton, or about $20 (5.7 per cent) below comparable domestic prices. These reference prices were calculated on the basis

of data supplied by the Japanese Government, evidently obtained from the six major steel firms and some smaller electric-furnace mills. They include a "reasonable" profit margin and assume an average capacity utilization rate of 85 per cent for Japanese mills. The following input costs were used: raw materials $165.19, labour $68.56, overhead and miscellaneous costs $64.05 per ton of finished steel. To the $297.80 per ton production cost was added $17.00 for depreciation and $34.00 for interest and profit. The latter yields a 13 per cent rate of return on total investment. Added to this were transport, insurance and handling costs to East Coast United States ports of entry. Additional reference prices for other steel categories were to be announced later, and "extras" such as special sizing or finishing of steel products would be subject to additions to the basic reference-price levels.

76. How the reference price regime will affect steel trade, the United States steel industry and other economic variables depends, of course, on the level of these reference prices themselves and on the administration of the regime. First, a great deal will depend on the accuracy of the monitoring system covering steel imports. To be effective, monitoring must be extremely close, and product coverage may have to go far beyond the 40-60 steel product categories initially proposed, possibly to include over 250 individual product groups. Moreover, it has been suggested that importers will inevitably find ways to circumvent any reference price system.

77. Second, while the idea is to use constructed values as the basis for reference prices for the most efficient Japanese suppliers, the reference prices may well end up closer to United States domestic production costs, that is, at a level that will constrain the market share of steel imports. Already a few days after the initial announcement of the reference price scheme the President of United States Steel Corporation proposed $360 per ton as an "acceptable" reference price, and there was a great deal of discussion of raising reference prices to provide the desired degree of shielding for the domestic industry. The fear that the reference price system would indeed become a purely protectionist device rather than simply preventing unfair trade practices appeared to be justified shortly after its announcement. Before the reference prices were even set in January 1978 several United States steel companies raised prices by an average of 5.5 per cent, indicating that they expected the impending reference price system to prevent the losses of market share to imports that would otherwise occur and expressing confidence that the reference prices would be set high enough to ensure this result. Moreover, various steel firms and members of Congress complained that, by being based on efficient Japanese mills' cost levels, the reference prices would permit the higher-cost European mills to continue dumping steel in the United States market.

78. Despite the relatively low levels of initial reference prices announced by the Treasury, the prospective evolution of the scheme may well focus on straightforward protectionism, with the import-competing industry threatening to go to Congress for more drastic relief if the reference price system proves inadequate. The reference price system would thus become very similar to the European "variable levy" system of agricultural import controls, with comparable effects on market access. If this happens, it will provide protection to the United States steel industry comparable to quotas, remove incentives for greater

efficiency and cost/price restraint, and encourage growth of the industry well beyond what can be justified on purely competitive grounds. There was also considerable concern over the implications for the effects on international competitiveness of domestic steel-using industries, which may lose export markets or themselves demand protection from imports due to higher steel costs. In January 1978 a study by the Federal Trade Commission estimated the annual cost of the reference price scheme at over $1 billion.

79. Fears that the United States steel industry would take advantage of protection to raise prices were reflected in various suggestions for governmental price restraints to accompany any shielding from imports that came about. In a report to the aforementioned interagency group, the Council on Wage and Price Stability argued that import curbs would not in fact significantly aid domestic industry in terms of output and employment. The industry's malaise was attributed to rapid increases in production costs and lagging efficiency, which would not be solved by import restraints. Furthermore, the domestic steel industry was held responsible for much larger than average price increases in recent years, and hence for contributing an important source of inflationary pressure in the economy. The report also noted that more stringent safety requirements had reduced efficiency in some steel plants by a significant amount, and that environmental requirements did indeed pose a major burden for the industry.

80. The reference price system is widely expected to roll back the share of imports in the American market from 20 per cent to 12-14 per cent. In 1977 three-fourths of all steel imports came from Europe and Japan, and the remainder (5 million tons) from developing countries. Since some of the heaviest steel discounters have been developing countries like the Republic of Korea, they can be expected to be hard hit by the reference price system. In 1976, the Republic of Korea increased its sales on the United States West Coast to 9 per cent of the import market, or 292,430 tons, up from 6 per cent in 1975, generally underselling Japanese steel by 10 per cent. Moreover, a number of steel plants in developing countries can be regarded as especially vulnerable in view of the relative efficiency of recently-constructed mills and much lower labour costs. 10/

81. The reference price regime implemented by the United States at the beginning of 1978 is widely regarded as an interim device, in effect a prelude to a broader international agreement in steel trade embodying quantitative controls, agreed floor prices, or both.

82. In 1977, European steel companies had already offered to limit on a voluntary basis their steel shipments into the United States market for two to three years provided Japan and other major exporters did likewise. This proposal followed by

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10/ Observers also widely expect the "reference price" system to be extended to imports of copper products, where developing country suppliers have had considerable success in recent years. In December 1977 the United States producers of zinc also requested temporary relief from imports under Section 201 of the 1974 Trade Act.

two weeks a similar suggestion to impose VERs on steel shipments by Japanese steel producers. The European offer involved voluntary export restraints based on 1974 United States levels of imports, the year the last VER between Europe and the United States expired. Since imports from developing countries have grown considerably more rapidly since that time, the implication was that there would be an administered shift in imports in favour of Europe as part of any new VER.

83. Most responsible observers favour a complete restructuring of the United States steel industry, with large-scale closures of old plants and construction of major new facilities. A permanent solution to the problems of the United States steel industry above all requires consolidation and rationalization, and this probably means selected mergers to pool resources and eliminate inefficient plants. 11/ However, the Department of Justice must first permit increased industry concentration, taking into account the role of imports in the competitive environment, or permit multiple firms to jointly operate major facilities such as blast furnaces, coke ovens, or finishing mills on a consortium basis. A number of major new "green field" plants have been under consideration by several firms to dramatically decrease costs and increase productivity. But thus far none have been started due to low profitability and high uncertainty in the industry. Partly for this reason, the overall goal of the Administration's plan is to increase the steel industry's earnings by $900 million and lead to the re-employment of 25,000 steelworkers. Imports are likely to be rolled back from 20 to 14 million tons.

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11/ One response to plant closures and their regional economic impact emerged late in 1977 in connexion with the shutdown of the obsolescent Campbell Works of the Youngstown Sheet and Tube Company, idling 5,000 steelworkers. The Department of Housing and Urban Development, prompted by community and labour groups, commissioned a study of the feasibility of purchasing the plant from the Lykes Corporation and reopening it under community ownership with an initial investment of $120 million and eventual modernization costs of $415 million by 1985. Whether this can be accomplished without massive government aid and, hence, further competitive distortions in the steel industry is questionable.

## B. The European Economic Community

### Demand and output

84. The recession of 1975-76 resulted for the European Economic Community as a whole in a considerable decrease in the activity of the iron and steel industry. According to the United Nations Economic Commission for Europe, the setback in steel industry was mainly due to a critically weakened demand, which declined in Community member countries by 20 to 25 per cent, accompanied by heavy destocking, which was estimated at about 20 million tons. 12/ Due to slackened steel demand, new orders were also greatly reduced in 1975. New intra-EEC orders declined by 16.9 million tons, or 19.5 per cent, while new orders from third countries fell by 21.8 million tons or 20.2 per cent. Total deliveries in the Community countries were also reduced in 1975 by 24 million tons or 21.2 per cent compared with 1974.

85. There was a considerable slowing-down of activity in almost all the Community countries in major steel consuming sectors. Both non-residential and housing construction registered a drop in activity. In the Federal Republic of Germany and France the decline in construction amounted to about 10 per cent; in the United Kingdom and Belgium to 5 and 3 per cent respectively. In the motor-vehicle industry, passenger car output declined in Italy by 21 per cent, in the United Kingdom by 18 per cent, and in France by 5 per cent. In the Federal Republic of Germany, automobile production increased slightly by 2.4 per cent compared with 1974. On the other hand, the shipbuilding industry remained a strong steel consuming sector during 1975 despite a decline in the volume of ships started in some of the Community member countries. Ships started in 1975 were reduced by 34.4, 6.6, and 45.0 per cent in Denmark, the Federal Republic of Germany and the Netherlands, respectively, whereas in France, Italy and the United Kingdom ships started increased by 4.1, 10.6, and 0.0 per cent, respectively.

86. Deliveries declined in all steel consuming sectors with the exception of the shipbuilding industry, which experienced an increase by 20 thousand tons or 1.1 per cent. Total steel deliveries amounted to about 93 million tons in 1975, which represents a drop of 23.5 million tons or 20.2 per cent compared with 1974. Deliveries to all manufacturing industries fell by 23 per cent, while exports declined by 8.5 million tons or 20.6 per cent in 1975. The reduction of deliveries in all major steel consuming sectors was attributable to a considerable fall in steel consumption of about 90 million tons in 1975, representing a decline of 29 million tons or 22.8 per cent. The weakness of home demand was reflected in the declining crude steel output and low levels of capacity utilization. Crude steel

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12/ United Nations Economic Commission for Europe, Economic Survey of Europe, (United Nations publication, Sales No. E.76.II.E.1). See also Official Journal of the European Communities, Volume 19, No. C 232, 4 October 1976. Commission of the European Communities, Common Steel Policy, COM(76) 543, 8 October 1976. See also Economic Commission for Europe, The Steel Market in 1974, ECE/STEEL/11, 1975.

output fell by 30 million tons or 19.3 per cent from the previous year 1974. Capacity utilization in 1974 registered 86.9 per cent, as compared with 66.1 per cent in 1975, the lowest level for the period 1970-1975. The Community's major steel producer, the Federal Republic of Germany, registered a capacity utilization rate of 65 per cent as compared with 89 per cent in 1974. In 1977 total production was about 126 million tons, or about 80 per cent of capacity.

87. The total volume of world steel exports in 1975 attained 109 million tons, a decline of 16 million tons or 13 per cent as compared with 1974. But in the Community countries, finished steel exports just exceeded 50 million tons as compared with 62 million tons in 1974. Lower rates of exports occurred in all member countries except Italy. The most important tonnage decreases occurred in the Federal Republic of Germany (5.9 million tons or 27 per cent). In Belgium-Luxembourg, the Netherlands and France the decline was estimated at 3.9 (24 per cent), 1.7 (30 per cent), and 1.6 (17 per cent) million tons, respectively. Steel exports from the United Kingdom in 1975 remained at roughly the 1974 level.

88. EEC steel exports to developed countries fell in 1975 by 20.3 per cent and to developing countries by 7.3 per cent. Steel exports to Japan fell by 73.1 per cent, while exports to the United States declined by 45 per cent. Many of Europe's traditional export markets have been captured by new suppliers, particularly in developing countries. During the past 10 years, Europe's 70 per cent share of African, Asian and Middle East steel imports has been cut to under 30 per cent by suppliers in such countries as the Republic of Korea, Brazil and South Africa.

89. Imports of steel products by the Community as a whole, on the other hand, declined only slightly - by 1.9 million tons or 6.0 per cent below 1974 - see table 6. Intra-EEC trade in 1975 fell by 2.7 million tons or 12.3 per cent, while imports from the United States decreased by 36 per cent. In contrast, imports from other European OECD countries increased by 19 per cent, whereas imports from Japan doubled in 1975 (107.8 per cent).

Pig-iron and raw materials

90. Considering the depressed condition of the steel market during the 1975 recession, the raw materials sector also was subject to reduced activity in the European Community member countries. Pig iron consumption in the Community as a whole declined by 23 million tons or 20.6 per cent in 1975. Total pig iron production reached a low level of 88.6 million tons in 1974, which represents a fall of 23.3 million tons or 20.8 per cent compared with 1974. Pig iron exports fell by 813 thousand tons or 43 per cent while imports fell by 623 thousand tons or 29.7 per cent.

91. The recession in the iron and steel industry resulted in significant cutbacks of iron ore and other raw materials shipments. Iron ore consumption in the Community declined by about 30 million tons or 15 per cent in 1975, although production was reduced by only 5.5 per cent. This difference between consumption

Table 6

EEC production, consumption and trade in crude steel, 1971-1975
(thousands metric tons)

| Year | Production | | | Imports | | | Exports | | | Consumption | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Thousands of tons | Change | | Thousands of tons | Change | | Thousands of tons | Change | | Thousands of tons | Change | |
| | | Quantity | % | | Quantity | % | | Quantity | % | | Quantity | % |
| 1971 | 128 117 | | | | | | | | | 109 694 | | |
| 1972 | 139 079 | +10 962 | + 8.6 | 34 358 | | | 49 057 | | | 118 806 | + 9 112 | + 8.3 |
| 1973 | 149 438 | +10 359 | + 7.4 | 35 801 | +1 443 | + 4.2 | 53 256 | + 4 199 | + 8.6 | 124 593 | + 5 787 | + 4.9 |
| 1974 | 155 646 | + 6 207 | + 4.2 | 87 773 | -8 028 | -32.4 | 61 391 | + 8 135 | +15.3 | 126 982 | + 2 389 | + 1.9 |
| 1975 | 125 626 | -30 020 | -19.3 | 25 884 | -1 889 | - 6.8 | 50 256 | -11 135 | -18.1 | 97 979 | -29 003 | -22.8 |

Source: United Nations Economic Commission for Europe, The Steel Market in 1975, (for production and consumption)
(United Nations publication, Sales No.E.76.II.E.13)

and production shifts is due to th large reduction in iron ore imports, which amounted to 30 million tons or about 20 per cent lower than 1974. The most important single Western European importer of overseas ores, the Federal Republic of Germany, reduced its imports by about 20 per cent. The slowdown of iron ore shipments to Belgium, France and the United Kingdom was even more serious, with deliveries cut in some cases by 40 per cent or more. The larger cutbacks in imports of iron ore came from European non-EEC countries.

92. The scrap market is an exceptionally sensitive sector, since supply flexibility is limited. Moreover, other steelmaking raw materials are subject to long-term supply agreements while scrap contracts are usually concluded on month-to-month basis. Thus, following a period of acute shortages in 1974, scrap consumption in the Community as a whole declined by 10.8 million tons or 15.9 per cent, and EEC supply was also reduced by about the same percentage or 11.7 million tons. Exports of scrap, on the other hand, declined by 14 per cent and imports by 15.1 per cent compared with 1974.

93. In 1975 blast furnace coke production in the Community countries amounted to 75 million tons, which was about 3.7 million tons less than in 1974. Coke output increased in the Federal Republic of Germany and decreased substantially in Belgium. Exports were reduced by 6.4 million tons or 37.6 per cent and imports by 3.7 million tons or 32.2 per cent during 1975.

Production capacity and capital outlays

94. Despite the recessionary conditions in the European Community as a whole and particularly in the iron and steel sector, the member countries pursued efforts to strengthen their competitive market position through improvement of the existing facilities and further expansion. In a report on investment in the coal and steel industries for 1975, the EEC Commission made available information which shows investments made in the iron and steel industry by sector for the period 1971-1975. Total investment in 1975 amounted to $4.4 billion, which represents an increase of 20 per cent over 1974. By sector, the largest amount was spent on rolling mills (about $1.9 billion) and the least on pig iron capacity. Investment in raw materials production increased by 20 per cent and in crude steel by about 20 per cent from 1974 to 1975.

95. Effective capacity for the production of pig iron and crude steel, according to recent estimates, by 1979 will be 216 million tons, an increase of 26 million tons or 13.5 per cent from 1975 to 1979. Effective pig iron capacity is estimated to be 151 million tons by 1979, an increase of 15 million tons or 10.6 per cent. As a result of the recessionary conditions in the iron and steel industry, capacity utilization reached the historically lowest rate of 66.1 per cent in 1975, which represents a decline of 23.9 per cent compared with 1974. During 1976 capacity utilization increased slightly, by 1.2 per cent.

96. European mills have greatly expanded their export efforts in recent years in order to alleviate the serious "overcapacity" situation. For example, British Steel has seen production drop from 25 million tons in 1972-1973 to 17.2 million tons in 1975 and 19.7 million tons in 1976. Nevertheless, it has embarked on an

$8.7 billion investment programme to raise capacity to 30 million tons. Unless the domestic United Kingdom market expands far beyond what currently seems reasonable, the excess will have to be exported - 10-25 per cent of such excess now goes to North America. Similarly, Italian and French steelmakers, both under heavy government influence, have concentrated increasingly on export markets - 40 per cent of total production in the case of France. Italian capacity is already at 30 million tons, while domestic consumption is estimated at 20.5 million tons. Sweden's steel industry has likewise suffered from heavy overcapacity, ameliorated only by the Government's programme to subsidize inventories of finished steel products for companies that do not lay off workers.

Employment and productivity

97. The recessionary developments in the iron and steel industry also had to have an adverse effect on the employment. Yet the total number of persons employed in 1975 declined by only 6,500 or .8 per cent from 1974 to 1975. This decline is actually much higher if it is coupled to the decline in the number of hours worked per month and per worker which fell in all EEC countries with the exception of Denmark. In addition, crude steel output per worker declined in all Community countries during 1975. In the Federal Republic of Germany, for example, the index of crude steel output per worker fell by 27.1 points, while in Belgium the index declined by 27.8 points. The smallest cutback in the index was observed in Italy, a decline of only 6 points in 1975. In the EEC as a whole, an estimated 20,000 jobs were lost between 1974 and 1976 to imports and depressed demand in the steel industry, and additional losses in late 1977 averaged 3,000 per month. Another 100,000 workers were on short-time.

Prices and costs

98. Despite the reduced activity in the EEC iron and steel industry and the abundant supply of basic raw materials, the upward trend of costs, particularly those of iron ore, continued. This can be explained by factors like variations of the exchange rates, producers allowances and rebates, movement of freight rates and the availability of choice between different sources of supply. For France in 1975 iron ore prices increased on the world market between 40 and 20 per cent, although the French average c.i.f. price of imported ores increased by only 15 per cent. In most EEC countries the price of imported iron ore increased in 1975.

99. Scrap prices, on the other hand, declined considerably in 1975 in almost all EEC countries, except in the United Kingdom. The index of home scrap prices in Belgium declined by 40.6 per cent from January 1975 to October 1975, while in Denmark, France, Luxembourg and the Netherlands the decline amounted to 13, 31.1, 39 and 20 per cent respectively, for the same period. On the other hand, the index increased by 11 per cent in the United Kingdom from January 1975 to October 1975.

100. Finally, the index of blast-furnace coke prices increased in some and declined in other EEC countries. Thus, in Belgium, Luxembourg and France the index fell by 14.3, .7, and 8.2 per cent respectively, whereas in Denmark, the Netherlands and the United Kingdom it increased by 30.9, 1.9, and 31.1 per cent respectively during the period January 1975 to October 1975.

101. In the majority of ECE countries domestic steel prices for finished steel products declined during 1975. In the case of the Community countries a distinction should be made between the actual price revisions, i.e., changes of basis prices, versus temporary rebates. In 1975 there were a number of changes in basis prices in the ECE countries. In January 1975 major price revisions were introduced in the Federal Republic of Germany and in the United Kingdom. In the Federal Republic of Germany basis prices were increased between 3 and 11 per cent and in the United Kingdom by an average of between 13 and 18 per cent during the course of 1974. During 1975 major revisions of basis prices occurred in Belgium, Luxembourg, Italy and the United Kingdom.

102. To respond to the threat of cheaper imported steel products the European Economic Community countries for many years practised a "flexible price policy", consisting mainly in the application of official and published "temporary rebates, which are subject to revisions according to the changing market conditions." 13/ The application of temporary rebates provides better market transparency, since the rebates granted are much closer to the actual level of business transactions than the published list prices. In view of the increasing market slackness in the early months of 1975 all member countries applied temporary rebates, the importance of which varied according to country. Another important development in price trends in 1975 was the drop in steel prices on the world market. ECE export prices for finished steel products started to fall during the second half of 1974 and continued to weaken throughout 1975, showing a slight upward movement toward the end of the year. Overall, prices of basic steel products declined between 42 and 51 per cent during the period July 1974 to March 1975.

International competitiveness

103. Even in the absence of the aforementioned severe recession in the iron and steel sector, the European Economic Community was heading for substantial "overcapacity". This is because of consistent efforts by individual steel firms, frequently with government support and financing, to enhance their efficiency and competitiveness in national and international markets. Because of regional economic dislocation accompanying the phasing-out of older and less efficient plants, the new capacity added to the overall supply capabilities of the industry at the very time demand was under severe downward pressure.

104. The excess capacity in the steel industry arising in this way - with operating rates between 60 and 70 per cent - had three effects. First, it generated a great deal of sensitivity to imports, especially from Japan, which took a share of the market that otherwise could have been served from idle Community capacity. In an agreement in Mexico City in 1975, the ECE reached an accommodation with Japan to limit exports to Europe to 1.2 million metric tons annually, and indeed export levels in 1976 dropped 25.5 per cent below 1975 levels. During the preceding

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13/ United Nations Economic Commission for Europe, The Steel Market in 1975, (ECE/STEEL/15) (United Nations publication, Sales No. E.76.II.E.19).

10-year period, imports as a per cent of total consumption increased from 8 to 11 per cent. The European steel industry has complained about competition from socialist and developing countries, alleging dumping and export subsidies in much the same way as United States steel firms alleged unfair trade practices by Japanese and European mills. So in 1977, the Community moved against South Africa, the Republic of Korea, and Mexico, as well as perhaps additional developing and socialist countries, with the intent of further controlling competition from imported steel. One effect was to increase pressure from some of these same suppliers in the United States, the principal remaining open market among the industrial countries.

105. The second effect was to gear output increasingly to export markets, particularly the United States. As indicated earlier, the depressed conditions in the United States steel sector generated a strongly adverse reaction to imports from Europe and alleged subsidization and dumping, with concomitant pressure for protection.

106. The third effect was to produce plans for "rationalizing" the industry, i.e., adjusting capacity in an orderly way to a level that would satisfy the majority of expected internal EEC demand at high levels of efficiency. These took the form of the Simonet and Davignon Plans, which called for a number of special measures to be undertaken at the EEC level. Under the Davignon Plan, the measures include persuading foreign producers to restrict export supplies to the EEC and the application of minimum domestic selling prices, i.e., a form of cartel arrangement called Eurofer. They also call for permitting construction of new steel plants only if the producers involved agree to dismantle old plants of equivalent size. EEC investment assistance is being given only to projects that meet the Davignon Plan's goals. National assistance to steel firms which do not meet this test could conceivably be countered by Community action against State subsidies. The purpose is to bring about a far-reaching modernization of the European steel industry without adding to excess capacity at the same time. Overall, it is estimated that 100,000 of Europe's 750,000 steelworkers will be made redundant as part of such a broad-based restructuring of the industry. These personnel cuts in the European setting can be made only by buying off workers with early retirement plans or shortened work schedules.

107. The Davignon Plan is intended, in essence, to buy time. The eventual goal is to match EEC capacity to the Community's internal needs at high levels of efficiency and reduce the steel industry's dependence on exports and government aids to developing steelmaking capacity aimed directly at export markets.

108. Mergers of steel firms are being attempted as another way to improve the steel industry's competitiveness in Europe. For example, three of Sweden's largest steel companies have been merged into Swedish Steel, Ltd., with an eventual planned reduction in the combined work force from 18,000 to 13,500 and an effort to increase the amount of steel produced per worker from 200 to 300 metric tons within five years.

109. By the end of 1977, it had become evident that major elements of the Davignon Plan were not working as intended. Already in 1976 under the Simonet Plan, Community objectives for voluntary production quotas failed because most firms refused to comply. Subsequently, various European steel firms were found to be undercutting the minimum prices set by Eurofer, and import penetration continued above acceptable levels. As a result, a new package of emergency measures was advanced that includes a proposal for minimum import prices for steel very much like the United States reference price system. This measure was aimed directly at steel suppliers in Japan, Eastern Europe, Spain and the developing countries - although it was expected that Spain would voluntarily adhere to the Community steel cartel's minimum price regime and that new trade agreements with Eastern European suppliers would place quantitative limits on that particular source of disruption. It followed a proposal by France to implement its own "defensive measures" if the Community found itself unable to take effective action. The proposed minimum import prices were intended to make possible a 15 per cent price increase for certain major steel products in 1978.

110. In December of 1977 the EEC followed the United States lead and established a minimum-import price regime for steel, following notification by France that it would otherwise impose unilateral import controls. The EEC minimum import prices took effect on 1 January 1978 for a three-month initial period. They are based on production costs of the most efficient foreign suppliers, and steel sold below the c.i.f. import value thus calculated will automatically be subject to a levy. The minimum price regime is subject to renewal, pending negotiation of "voluntary" export restraints and adherence to EEC internal minimum steel prices by such major suppliers of imports as Japan, Spain, the socialist countries of Eastern Europe, the Republic of Korea, South Africa and Brazil. Mandatory adherence to the minimum internal prices already applied to steel reinforcing rods, hot-rolled items and certain types of steel plate.

111. Structural differences between national steel industries in Europe increase the difficulty of making a co-ordinated plan of this type work. For example, the steel sector in the Federal Republic of Germany is closely integrated into the mechanical engineering industry. Italy has large numbers of aggressive small steel firms (Dresciani) anxious for export sales. Belgium has obsolescent plants located in economically depressed areas. In the United Kingdom steel is a nationalized industry and in 1977 British Steel's operating losses were running at 20 per cent of sales. In several other countries government ownership and credits are major factors in the steel industry. So there is the inevitable question whether a single Community solution will be satisfactory to all.

112. The EEC Commission has also proposed an international solution to international steel problems of the late 1970's. First, European and Japanese steel producers would undertake not to "perturb" or compete "unfairly" in the United States or third-country markets. Second, the United States steel industry would, in return, ease its pressure for protection against imports, especially through anti-dumping charges and legal actions aiming at the imposition of countervailing duties against alleged export subsidization of foreign steel. Third, a series of co-ordinated steps would be undertaken to restructure the world steel industry, involving phasing-out old plants in Europe and the United States and limits on the growth of new steelmaking capacity in Japan and the developing countries. Such an international arrangement represents a logical extension of EEC policy in the iron and steel sector.

## C. Japan

### Demand and output

113. The setback in the Japanese iron and steel industry is mainly attributed to the fall in new orders in the home and export markets. Home orders and exports declined by 14.3 per cent and 11.2 per cent respectively from 1974 to 1975. The largest reduction was observed in the electrical and non-electrical machinery sectors, while the smallest occurred in the motor vehicle (-7.1) and shipbuilding sectors (-10.5). However, the construction index showed an upturn of 7.7 per cent during 1975 and the automotive industry reached a record activity level of 4.5 million units. Nevertheless, steel deliveries to these two vital sectors also declined. Mainly, this is the result of considerable destocking, which includes inventories held by merchants and the steel-using industries themselves, an inventory run-down of almost 17 per cent from 1974 to 1975. Finally, steel for export also declined by 14.4 per cent as a result of the recessionary developments in the economic activity in many of the traditional Japanese steel markets. The weakened demand for steel in all steel-using industries caused a decline in Japanese steel consumption by over 11 million tons or 14.5 per cent, a reduction in steel production by almost 15 million tons or 12.7 per cent from 1974 to 1975.

### Trade

114. Japan is the world's foremost finished steel exporter. In 1975 its exports reached 28.9 million tons, which was 3.3 million tons or 10.2 per cent less than the previous year, as noted in table 7. The distribution of Japanese exports in finished and semifinished steel products by country and area of destination shows an increasing share of Japanese steel exports to developing countries. In 1975, 14.1 million tons or 48.8 per cent was shipped to developed countries while 14.8 million tons or 51.2 per cent went to developing countries. Of the total shipments to developed countries, 5.1 million tons or 36.3 per cent went to the United States market - which represents a drop of 0.6 per cent from the previous year. To the nine EEC countries Japan's exports amounted to 1.6 million tons or 11.2 per cent of the total shipments to developed countries.

115. Japanese imports of steel products, on the other hand, are minimal. Total imports in 1975 amounted to 108 thousand tons, which represents a fall of 33 thousand tons or 23.4 per cent compared with the previous year 1974. In 1974 only 18,000 tons of steel were imported from non-OECD countries, and in 1975 this had declined to only 9,000 tons. In order to better control its steel exporting firms and to facilitate efforts to maintain sound marketing conditions in a difficult and stagnant world market, Japan decided at the end of 1975 to create an export cartel. 14/

### Pig iron and raw materials

116. As a result of the slow-down in steel consumption, production and exports, pig iron demand and supply were also reduced during the year 1975. Apparent pig iron consumption fell by 4.8 million tons or 5.3 per cent from 1974 levels. During the same period, pig iron production reached a low of 86.9 million tons, which represents a decline of 3.5 million tons or 3.9 per cent compared with 1974. Trade data for pig iron and ferro-alloys show a three-fold increase in Japanese exports from 1974 to 1975 while imports of the same products were reduced by 70.0 per cent during the same period.

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14/ United Nations Economic Commission for Europe, The Steel Market in 1975 (United Nations publication, Sales No.E.76.II.E.13).

Table 7

Japan: production, consumption and trade in steel products, 1971-1975
(thousand metric tons)

| Year | Production | | | Imports | | | Exports | | | Consumption | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Thousands of tons | Change | | Thousands of tons | Change | | Thousands of tons | Change | | Thousands of tons | Change | |
| | | Quantity | % | | Quantity | % | | Quantity | % | | Quantity | % |
| 1971 | 88 557 | | | | | | 23 194 | | | 57 699 | | |
| 1972 | 96 900 | + 8 343 | + 9.4 | 103 | | | 20 929 | -2 265 | - 9.8 | 68 888 | +11 189 | +19.4 |
| 1973 | 119 322 | +22 422 | +23.1 | 213 | +110 | -106.8 | 24 825 | +3 896 | +18.6 | 87 181 | +18 293 | +26.6 |
| 1974 | 117 131 | - 2 191 | - 1.8 | 141 | - 72 | - 33.8 | 32 228 | +7 403 | +29.8 | 75 753 | -11 428 | -13.1 |
| 1975 | 102 313 | -14 818 | -12.7 | 108 | - 33 | - 23.4 | 28 942 | -3 286 | -10.2 | 64 736 | -11 017 | -14.5 |

Source: United Nations Economic Commission for Europe, The Steel Market in 1975 (United Nations publication, Sales No.E.76.II.E.13).

117. The demand for steelmaking raw materials also shows a downturn in 1975 as a result of the setback in the steel industry. Almost 100 per cent of the iron ore consumed by the Japanese iron and steel industry is imported. Total iron ore consumption in 1975 amounted to 132.7 million tons, of which 131.7 million tons or 99.5 per cent was imported. Consumption and imports of iron ore were reduced by about 10 million tons or 7 per cent from 1974 to 1975. About 53.0 per cent of iron ore is imported from non-European OECD countries (mainly Australia) and the remainder (47.0 per cent) from the rest of the world.

118. In early 1975, the Association of Iron Ore Exporting Countries (AIEC), was formed by ten main iron ore producing countries - Algeria, Australia, Chile, India, Mauritania, Peru, Sierra Leone, Sweden, Tunisia and Venezuela - whose total production amounted to 223 million tons or 27 per cent of the world iron ore output in 1974. Its effects on world iron ore prices, however, were not perceptible during the period in question. Any eventual effects will bear particularly heavily on Japan.

119. On the other hand, 92 per cent of the iron and steel scrap consumed by the Japanese iron and steel industry is supplied by domestic sources and only 8 per cent is imported. During 1975 total consumption of steel scrap amounted to 28.9 million tons, which represents a fall of 10.4 million tons or 26.5 per cent from the previous year's level. Domestic supply declined by 7.6 million tons or 16.5 per cent, while imports and exports fell by 466 thousand tons or 16.5 per cent and 26 thousand tons or 0.6 per cent, respectively, during the same period. Finally, coke production and consumption dropped by 1.1 per cent and 10.7 per cent respectively from 1974 to 1975.

Capital outlays and employment

120. Despite the unfavourable economic conditions in all segments of the Japanese iron and steel industry in 1975, steel firms invested heavily in 1975. Capital outlays amounted to $4.3 billion, an increase of $1.3 billion or 43.9 per cent over 1974. This high level of investment was largely attributed to the construction of new blast furnaces, requirements for anti-pollution facilities, and increases in construction costs. In 1975, two new blast furnaces and two new LD converters were put into operation. As a result, production capacity increased by 3.4 million tons (3.0 per cent) and 3.5 million tons (2.4 per cent) in the pig iron and crude steel sectors respectively, from 1974 to 1975.

121. Finally, because of the setback in the Japanese iron and steel sector during the year 1975, employment in the industry also declined by 6,000 or 1.3 per cent compared with 1974, whereas the average number of hours worked per month per worker amounted to 177.9 hours and 163.3 hours during 1974 and 1975 respectively. This represents an average decline of 14.6 hours per month or 8.2 per cent. The index of annual crude steel output per worker was 13.0 per cent lower during 1975 than during 1974.

International competitiveness

122. In 1976 the Japanese steel industry employed approximately 340,000 workers in over 70 companies. Its production was about 110.4 million tons of crude steel of which 44 per cent, or 52.1 million tons, was exported - over twice the percentage of the Federal Republic of Germany, Japan's nearest competitor in international steel trade. During the past 20 years, Japanese steel production has increased over tenfold (compared with a 9 per cent gain for the United States), rising to almost 16 per cent of global production.

123. The Japanese steel industry has always worked closely with the Government. Special reconstruction assistance was provided in the early post-war period, including widespread use of loan guarantees to reduce interest costs, as well as export incentives. The industry essentially consists of two "tiers": (a) the "big six" integrated steel companies comprising Nippon Steel, Nippon Kokan, Kawasaki, Sumitomo, Nisson and Kobe; and (b) a large number of smaller companies. The former appear to be highly efficient - 83 per cent of Japanese steel production is by oxygen converter (versus 61 per cent in the United States) and two-thirds of the world's largest blast furnaces are located in Japan. These firms operate with very high capital/labour ratios, with output per 100 man-hours in 1975 reaching 9.35 metric tons of finished steel (versus 3.13 metric tons in the United States), and rising 166.4 per cent since 1964 (versus 17.5 per cent in the United States). The latter group of companies, on the other hand, are far smaller and concentrated in the volatile end of the market dominated by structural steel. They are highly leveraged, often with over 80 per cent debt. Unlike the long-term supply contracts that form a major part of the large firms' business, the small operators concentrate heavily on the spot market and export through Japanese trading companies. Because of their generally precarious financial position, they move quickly to exploit new market opportunities abroad and are allegedly the source of much of the disruptive behaviour attributed to Japanese imports into Western Europe and the United States in the mid-1970s.

124. Besides high efficiency and a strong export orientation, Japanese competitiveness in world steel markets can be ascribed to construction of plants prior to the recent rapid cost-inflation, reduced shipping costs for raw materials and finished products, an undervalued national currency for extended periods, and lower wages. In the latter area, Japanese labour costs were $0.65, $0.85 and $6.31 per hour in 1957, 1964 and 1976, respectively, compared with United States figures of $3.22, $4.61 and $12.22 at prevailing exchange rates. While the gap has narrowed, it remains wide. Combined with the aforementioned superior growth in productivity, 1975 Japanese labour costs were only $62.99 per metric ton of finished steel, compared with $136.53 in the United States.

125. Large scale of plant has been effectively used to raise Japanese production efficiency. For example, the largest mills are the Nippon Kokan plant at Fukuyama and the Kawasaki plant at Mizushima, with capacities of 18 and 13 million net tons, respectively. This compares with the largest United States plants, which have 7 or 8 million net tons of annual capacity. Such plants in Japan appear to be designed for optimal materials flow, rely heavily on computer-controlled production systems, and are invariably located in coastal areas to reduce transport costs. Economies of scale make themselves especially felt in blast furnaces, where 52 out of 72 are classified as "large" - with an inner volume of over 2,000 $m^3$ - compared with 5 out of 192 in the United States. This results in very low coke usage per ton of steel produced (30 per cent less in Japan than in the United States) and much greater efficiency in the pig iron phase of production.

126. There also appears to be a good deal of evidence that the ability of Japanese steel firms to meet the precise needs of customers, together with extraordinary sales and service efforts, have secured overseas sales quite apart from competitive pricing.

127. Japanese steelmaking technology tends to be relatively advanced. Over 30 per cent of Japanese production uses continuous casting (compared with under 10 per cent in the United States), which confers an efficiency advantage of perhaps 7-8 per cent. These figures compare with 28 per cent continuous casting in the Federal Republic of Germany and 18 per cent in France, for example. (Continuous casting allows steel to flow from furnaces to rolling mills without costly cooling and reheating cycles.) Over 80 per cent of Japanese steelmaking furnaces are BOFs and only 1 per cent are OHs, compared with 61.6 per cent and 19 per cent in the United States. These figures also compare with 72 per cent BOFs in the Federal Republic of Germany, 68 per cent in France and 52 per cent in the United Kingdom. Electric furnaces (which account for the remainder) are roughly 30 per cent more efficient in Japan than in the United States.

128. Besides a strong basic competitive position founded on a modern, technically-advanced and efficient steel industry, the behaviour of Japanese steel suppliers in export markets has been subject to intense scrutiny. 15/ The basic question is whether Japan uses exports as the principal "shock absorber" for cyclical swings in aggregate domestic steel demand in order to keep domestic output and employment in the industry stable, and sets its prices in world markets so as to achieve this objective. No matter what answer to this question emerges, it appears that Japanese steel supplies regarded by import competing firms as disruptive have been the most important single reason behind the recent spate of steel protectionism in Europe and the United States. These, in turn, may lead to a long-term organization of world trade in steel that is fundamentally against the interests of emerging suppliers in developing countries.

129. The American Iron and Steel Institute (AISI) study 16/ found Japanese steel firms highly dependent on debt financing from major domestic banks, which in turn are financed by the Bank of Japan, thus subjecting steel firms to very high fixed charges (and hence a reluctance to cut output in times of recession) and providing a ready vehicle for government extension of large-scale credits to the steel sector. Japanese steel firms, while acknowledging their leveraged capital structure and sources of financing, deny receiving any special assistance from government, either through the banking system or other subsidies or export incentives. Because of its rapid growth in the post-war period, the Japanese steel industry was unable to develop the kind of strong equity capital base that characterize steel firms in the United States and Europe. Moreover, in recent years international capital markets have been increasingly tapped by Japanese steel companies. Instead, they point to Western Europe and the developing countries as areas where government involvement and assistance to the steel industry is allegedly heavy and growing. Nevertheless, access to capital is likely to have had an important role in permitting Japanese expansion and modernization in the steel industry which might not have been possible under similar circumstances in Europe or the United States.

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15/ See especially American Iron and Steel Institute, Economics of International Steel Trade, May 1977; Merrill Lynch, Inc., Japanese Steel Industry: Comparison With Its U.S. Counterpart, June 1977; and Japan Iron and Steel Exporters Association, U.S.-Japan Steel Trade: Basic Views on Current Issues, July 1977.

16/ See foot-note 15.

130. The AISI study also concludes that Japanese steel firms discriminate in domestic and export pricing, with the latter being manipulated in order to keep home prices stable, provide extra sales volume, and assure acceptable average profit margins by lowering average costs through increased output levels. In recessions, export prices are allegedly cut well below home prices - in 1976, for example, export prices were ostensibly set at $35-45 per ton below production costs. The dual pricing system in recessions is made possible by market-access barriers that render impossible resale of exported steel in the Japanese home market. In boom periods, on the other hand, export prices are raised well above home prices in order to discourage foreign purchases and reserve supplies for domestic buyers. The Merrill Lynch study, 17/ on the other hand, questions the validity of the AISI data and maintains that c.i.f. prices of Japanese steel exports are generally higher than home prices. And the Japanese steel industry itself maintains that differences between domestic and export prices are entirely the result of differences in market conditions for different product lines - that export prices are not in fact set below cost in order to maintain production volume.

131. Finally, the AISI study sees no reason, on the basis of capital and raw materials costs and taking into account transport charges, why United States mills cannot compete effectively with Japanese suppliers were it not for discriminatory pricing, an undervalued Yen, border tax rebates, and domestic shortages and strikes. The Merrill Lynch conclusion, on the other hand, is that Japanese labour productivity is 60 per cent higher than in the United States steel industry, and production costs are 30 per cent lower, due largely to differences in average plant efficiency. With such cost differences, the Japanese industry would have a competitive advantage that is significant in any case.

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17/ See foot-note 15.

## III. PROBLEMS OF IRON AND STEEL SUPPLY

132. Conceptually, the iron and steel industry is a desirable one for forward-processing of indigenous raw materials in the developing countries. But aside from problems of market access and adjustment of import-competing industries such as those discussed in the previous section, there are supply problems facing developing countries as well. These include the availability of the large amounts of capital required to develop mills up to the task of supplying steel in the quantity and quality required by international markets. They also include skilled labour, advanced steelmaking technologies and distribution networks desirable for effective servicing of customers in a highly competitive environment. The absence of such resources would relegate the developing countries to structural steels, for example, the least desirable and most volatile end of the market.

133. Another set of supply constraints involves raw materials and energy imports, particularly coking coal, oil and electricity and ferrous scrap. Developing countries abundantly endowed with iron ore often lack one or more of these inputs, and this can materially reduce the benefits of downstream processing, especially when the balance-of-payments considerations are taken into account. Particularly coking coal and ferrous scrap present problems in this regard, and both are most readily available in the industrialized countries themselves. In the case of ferrous scrap, there are also questions of reliability of supply.

Materials inputs: pig iron production

134. The principal materials used to produce pig iron are iron ore, coking coal, and limestone. Steel, in turn, is the product of pig iron and steel scrap. Approximately 2 to 2 3/4 tons of raw materials are used by a typical mill in the production of one ton of raw steel.

135. Iron ore. The largest proportion of raw materials used in the production of iron and steel in relation to tonnage and value is iron ore. In order to produce one net ton of ingot steel, approximately 1.3 net tons of iron ore are required. The usefulness of iron ore in steel production varies both geographically and temporarily, and depends on the iron content of the ore and its location relative to the steel industry.

136. For example, although the ore mined and used in France contains less than 25 per cent iron, the proximity of the ore to the principal market area, as well as its adaptability to the furnace practices developed in that area, give it a favourable price-quality relationship with respect to higher-grade but more distant ores. 18/ In most other areas of the world, ores with less than 60 per cent iron content are normally not used for steelmaking without some kind of enrichment process such as pelletizing.

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18/ Skinner, W. and Rogers, D.C.D., Manufacturing Policy in the Steel Industry, (Richard D. Irwin, Inc., Homewood, Illinois) 3rd edition, 1970.

137. Iron ore resources discovered thus far and currently in production are distributed around the world, with about 70 per cent in developed countries and 30 per cent in developing countries. The developing-country share has been relatively constant during recent years.

138. Coking coal. The second important material input is coking coal, derived from various grades of bituminous coal. Although a number of fuels can be used as reducing agents in the smelting of iron, carbon supplied from coke has been found to be the best reducing agent for the economical production of iron. Therefore, coal has become a standard fuel for the steel industry. On the average, approximately one ton of coking coal is required to make a ton of steel. The coal is made into coke, which in turn is used in blast furnaces to reduce iron ore to pig iron. Almost all is consumed in the form of carbon monoxide, carbon dioxide, ashes, gases, and heat. This weight loss in the use of coal exerts a strong economic motive in siting of steel plants toward the sources of coal.

139. Although developing countries produce over a fourth of the world's iron ore, they produce only 5 per cent of the world's coal, while 95 per cent is produced in developed countries. The developing countries produce approximately 4.3 per cent of the world's coke. Thus, in order for the developing countries to be able to manufacture semi-finished and finished steel products, under conventional technology in steel production they must import large quantities of coal or coke from the developed countries, which have abundant resources and are the major exporters of this commodity.

140. Blast furnace technology has improved substantially in past decades and is expected to continue to do so. Practical scale ranges from 0.5 to 3.5 million tons of hot metal annually per furnace, although some now approach 4 million tons. Future blast furnace improvements are likely to reduce coke use by fuel injection to perhaps 250 kg per ton of pig iron, permit substitution of form coke for metallurgical coke and substitution of charcoal for coke, all of which will be of major benefit to developing countries where coking coal must be imported.

141. Direct reduction of iron ore to metallic iron suitable for steelmaking, thus circumventing the blast furnace, offers gains for developing countries by eliminating the need for coking coal in some processes. For example, natural gas is used as a fuel and reductant in all commercially successful applications on a large scale so far.

142. Limestone. The third major raw material used in the production of pig iron are fluxes which help to separate-out unwanted elements. Limestone is the major fluxing material, which is used mostly in blast furnaces to ignite with and carry off the gangue iron ore elements in the form of slag. The use of beneficiated ores, oxygen, and higher blast temperatures has reduced the limestone usage per ton of pig iron. For example, in 1956 0.362 tons of limestone was used per net ton of pig iron, while by 1966 that figure had been reduced to only 0.268 tons. 19/

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19/ Ibid.

Material inputs: steelmaking

143. The major inputs used in steelmaking are pig-iron and ferro-alloys, and iron and steel scrap. Pig-iron is the second stage in overall process of steelmaking, and is mostly produced in the developed countries, which in turn are the main exporters to developing countries. The developed countries on average account for 95 per cent of world production of pig-iron, while developing countries account for only 5 per cent.

144. Scrap. Iron and steel scrap has been an important raw material for steelmaking since the open-hearth furnace has come into use. Every ton of scrap consumed in steelmaking is estimated to conserve approximately 3 to 4 tons of iron ore, coal and limestone. The amount of steel scrap consumed depends on the steelmaking process itself (see below). For instance, the air-blown acid bessemer process uses about 10 per cent scrap in its feed, while the same process with oxygen-enriched blast can use up to 25 per cent scrap. Basic oxygen steelmaking processes use 25 to 30 per cent scrap. Open-hearth furnaces utilize from 35 to 65 per cent scrap, and the electric furnace is normally fed entirely with steel scrap. Steel mills are their own best suppliers of steel scrap. For every 100 tons of finished steel, the mills generate about 30 tons of scrap. For example, in 1967 60 per cent of the scrap required by the steel industry in the United States was generated within its own steel plants, and the remaining 40 per cent was purchased from outside sources.

145. Although it has been subject to a great deal of disagreement in industry circles, a recent study of the ferrous scrap sector forecasts the possibility of a severe shortage that could have an important bearing on developing countries selecting scrap-intensive steelmaking technologies. 20/ We have noted that scrap-intensive production of steel need not rely as heavily on the costly blast furnaces and coke ovens required in conventional steel production, thus having the benefit of severely cutting capital requirements (about 1/3 less than for BOFs) although the electric power requirements of EF technology remains a problem for many developing countries. The study forecasts a shortage of about 11 million tons for the United States by 1982, coupled to a very steep rise in ferrous scrap prices, based mainly on a shift in the mix of steelmaking capacity towards electric furnaces in the industrial countries, which use far more scrap than they produce. Scrap needs are likely to grow in other steel producing areas as well, especially in the developing countries, essentially doubling between 1973 and 1982. If such a shortage does indeed develop, it is likely that the major developed-country scrap exporters will impose export restraints or embargoes, as they did in 1974, thus severely damaging scrap-dependent developing country steel industries.

146. Steel production. Steel making is the third and final stage of the processing in the steel industry. Approximately 96 per cent of steel output is produced by developed countries and 4 per cent by developing countries. On the other hand, the consumption of steel by developing countries has been rising and accounted for 10 per cent in 1974. Whereas all developing countries

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20/ See William T. Hogan, S.J. and Frank T. Koelble, Purchased Ferrous Scrap: United States Demand and Supply Outlook (New York: Industrial Economics Research Institute, Fordham University, 1977).

combined produced only 4 per cent of world steel output in 1974, during the same year their consumption of steel amounted to 10 per cent of the total. The difference of 6 per cent was imported from the developed countries by the developing countries during 1974.

147. Summary. Since a primary concern is to develop an understanding of the factors affecting the location of the various stages of production in the iron and steel industry, table 3 summarizes the locational distribution of world production at each of the three stages of steel production for 1970-1974.

148. As that table illustrates, developing countries accounted for almost 28 per cent, on the average, of the world iron ore production (first stage), while during the same period the contribution of developing countries to the second and third stages of steel production accounted on the average for only 4.3 and 4.0 per cent, respectively.

Steel production alternatives

149. The production of steel from its raw materials (coal, iron ore and limestone) is a process involving the three basic steps noted above - coal is converted to coke, coke is combined with iron ore and limestone in a blast furnace to produce pig-iron, and pig-iron is further purified and, by adding alloying substances, is turned into steel in either an open hearth, basic oxygen, or electric furnace. Steel can also be produced entirely from scrap steel, including autos, steel cans and appliances, or by a combination of scrap and pig-iron. Each of these processes can be carried out independently of the others. But it is possible to gain certain economies of scale, savings in operating costs, improvements in quality, and better control of production and delivery if the processes are integrated. In modern steel plants, there has been a consistent trend toward integrating the coke ovens, blast furnace, and steel furnace, thus achieving more continuous and rapid processing. The principal techniques for manufacture of steel are classified according to the types of furnaces employed. These include: (1) the Bessemer or Thomas converter, (2) the open hearth furnace (OH), (3) the basic oxygen furnace (BOF), and (4) the electric furnace (EF).

150. Among the basic steelmaking processes, the Bessemer, Thomas and open hearth processes are expected to decline in relative importance, to be replaced by basic oxygen and electric furnaces. Basic oxygen furnaces alone, accounting for 50.8 per cent of steel production in 1975, are expected by UNIDO to account for 70 per cent of crude steel production by 1985. BOF production is then expected to decline to 60 per cent by the year 2000. Electric furnace production is expected to rise from 7 per cent in 1950 and 16.9 per cent in 1975 to 20 per cent in 1985 and 38 per cent in the year 2000.

151. Since steel is produced by all four methods, the choice is a matter of economics and depends upon: (1) the capital cost of a new facility and the costs of operation, which in turn depends upon the costs of raw materials, energy, and other inputs for each of the above methods, (2) the particular type or types of steel to be produced, since costs of each type vary greatly among processes, (3) the scale of operation, and (4) cost relationships that change through time, depending upon the technology, cost of raw materials and other inputs, and changing qualities and quantities of different types of steel bought and sold in various markets.

Table 6

Percentage contribution of developed and developing countries in world steel production at various stages of the production process, 1970-1974

| Country or area | Stage 1 Mining of iron ore | | | | | Stage 2 Production of pig iron | | | | | Stage 3 Production of crude steel | | | | | Consumption of crude steel | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1970 | 1971 | 1972 | 1973 | 1974 | 1970 | 1971 | 1972 | 1973 | 1974 | 1970 | 1971 | 1972 | 1973 | 1974 | 1970 | 1971 | 1972 | 1973 | 1974 |
| Developed | 73 | 74 | 72 | 72 | 72 | 95.8 | 95.7 | 95.5 | 95.6 | 95.3 | 96.2 | 96.0 | 95.9 | 95.9 | 95.6 | 97.0 | 97.4 | 97.2 | 97.8 | 98.3 |
| Developing | 27 | 26 | 28 | 28 | 28 | 4.2 | 4.3 | 4.4 | 4.3 | 4.5 | 3.8 | 4.0 | 4.1 | 4.1 | 4.3 | 3.0 | 2.6 | 2.8 | 2.2 | 1.7 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: United Nations Statistical Yearbook, various issues.

152. Open hearth. The charge of raw materials in the OH process is principally scrap steel and pig-iron in molten form, in an approximate 50-50 ratio. In addition, about 4 per cent by weight of the total charge is limestone, and a variety of other fluxes, carbons, and alloying materials are added at various times in order to obtain a precise sequence of chemical processes as well as the desired chemical and physical composition of the final product. The total charge is converted to raw steel at a rate of about 50 tons per hour. The open hearth process is relatively slow, formerly running nine to ten hours per sequence ("heat"), with about three heats per day and 20 per week. More recently, by a partial adaptation of the oxygen process, heat time has been reduced to 5-7 hours, and the number of heats per day and week has increased accordingly. The most recent open hearth furnaces produce 300 to 275 tons per heat, while a few are capable of producing from 500 to 600 tons per heat. 21/

153. Basic oxygen process. The basic oxygen furnace (BOF) differs greatly from the open hearth furnace, has the advantage of not requiring an external heat source, and is able to produce several hundred tons of steel per hour. Its main charge is pig-iron in molten form and steel scrap. About .33 tons of steel scrap and .80 tons of molten pig-iron is required per ton of steel produced. Other materials, such as fluxes, carbons, and alloying materials are added at appropriate times. However, the BOF process relies more than the OH on concurrent blast furnace operation to keep it supplied with hot pig-iron. The BOF process is violent and rapid, but controlled - heat times are less than an hour and 16 or more BOF heats may be made in a day. BOF vessels originally handled only about 35 tons of material per heat, but gradually have increased in size to about 200 to 300 tons per heat. A BOF shop ordinarily consists of two vessels, sharing raw materials handling, hot steel handling, and other overhead equipment and personnel.

154. The major differences between OH and BOF are: (1) OH is slower and relies heavily on ferrous scrap and fuel, while the BOF is much faster and relies on molten pig-iron and oxygen, (2) the quality of BOF steel is superior to OH steel, (3) because of the rapidity of the process, the BOF relies on a much faster and more complex system for handling material inputs, outputs, waste products and gases, and (4) the BOF process produces more scrap than it uses, while the OH process uses more scrap than it produces, and additional scrap must be supplied from steel fabricators, scrap dealers, or BOF steelmaking facilities. 22/

155. Electric furnace. The electric furnace (EF) was originally used strictly for producing stainless and heat-resistant steels. At present it is used to produce an increasing quantity of regular steel - 20 per cent of total United States raw steel production in 1974. EFs rely wholly on scrap steel as inputs, and require no blast furnace or coke ovens. However, they do

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21/ D.L. Hiestand, High Level Manpower and Technological Change in the Steel Industry, (Praeger Publishers Inc., New York, 1974).

22/ Hiestand, op. cit. supra.

require enormous quantities of electric power. About 600 kilowatt hours of electricity are needed to produce one ton of steel. For example, the major electric furnaces operated by Armco Steel in Houston, Texas, consume more electricity than an American city of 30,000 people. 23/

156. Electric furnaces are slightly faster than OH but much slower than BOF in producing raw steel. They can be run economically at almost any level of output, from 20 to 500 tons per heat. Electric furnaces can be used only where there are abundant supplies of ferrous scrap derived from other steel manufacturing or fabricating processes, where electricty supplies are ample and cheap, and where limited amounts of steel are needed - such as in speciality steel manufacturing or in areas so remote from principal steel centres that locally-made high-cost steel can compete effectively with cost-plus-transport associated with charges for OH or BOF steel from other areas. 24/ Because the BOF process produces scrap in excess of its own requirements, there has been some tendency for plants with BOF shops to add EF shops to produce standard carbon steels, even in major steel centres.

Economics of plant location

157. The basic raw materials in the manufacture of iron and steel having been specified - by far the most important being coal and iron ore - transport cost is assumed to be proportional to distance and weight. With roughly 1 to 2 tons of iron ore required to produce one ton of pig-iron, the weight reduction in iron ore that occurs during the refining process induces the location of the plant near iron ore sources. If coal is used as fuel for the plant and the means for taking oxygen from the iron ore during processing, then all coal used is lost in the form of carbon monoxide, carbon dioxide, ashes, gases and heat, and this exerts a strong economic incentive for plant location towards the source of coal. If iron ore and coal happen to be similarly located, from an economic point of view the raw materials weight-reduction during the refining process biases the optimal or cost-minimizing plant location toward the source of the raw materials. Finally, once the transportation cost of the finished product is taken into account if the sources of raw materials and the market for the finished products are located at the same site, the location decision is clear. If the source of the raw materials and the market of the finished product are at different sites, then the location problem involves balancing the forces drawing the plant towards the final-product market (saving in transport costs of the finished product) against the forces drawing the plant toward the sources of raw materials. This is a problem faced by many developing countries with respect to the creation of export-oriented iron and steel industries.

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23/ Council on Economic Priorities, Environmental Steel: Pollution in the Iron and Steel Industry (New York: Council on Economic Priorities, 1976).

24/ Miestand, op. cit. supra.

Capital requirements

158. While input requirements may pose serious problems for the iron and steel industry in the developing countries, capital requirements for new steelmaking facilities and the expansion of existing mills pose another problem. Using as a point of reference the United States steel industry, which subsumes a broad spectrum of steelmaking technologies, steel industry experts, investment analysts and independent consulting firms generally agree that the demand for steel will gradually expand and that the United States industry's present capacity is inadequate to meet domestic demand in the early 1980's. The American Iron and Steel Institute has estimated a 2.5 per cent annual growth rate in steel consumption for the near future. Given this growth rate, United States steel consumption by 1983 will be 135 million net tons. If one assumes total steel imports (net of exports) of 14 million net tons for 1983, then the United States steel industry must produce 121 million tons of final and intermediate steel products to meet 1983 consumption levels, which is equivalent to 185 million net tons of raw steel. Thus, by 1983 raw steel capacity must be expanded by 30 million net tons.

159. This capacity expansion can be accomplished in two ways. 25/ First, by "rounding out" existing facilities - that is, by adding more vessels for raw steel production to the existing ones, and by increasing the output of the existing blast furnaces, which will provide enough iron to enable the additional steel vessels to produce more raw steel. Second, by "greenfield" projects - that is, by providing new iron ore, coal, transportation, coking, blast furnace, steelmaking furnace, roughing-mill, and finishing-mill capacity. New capital requirements by the first method amount to $350, while by the second method they are estimated at $675 per net ton. These estimates are in constant prices. Hence the United States iron and steel industry, in order to expand existing capacity by 30 million net tons by 1983, must spend about $13.75 billion - or $1.55 billion per year over the nine-year period 1975-1983.

160. The industry will have to spend substantially more during this period in order to maintain the existing capacity. These expenditures are as follows: (1) capital expenditure to maintain the existing capacity of $18.0 billion or $2.0 billion per year for the nine-year period; (2) pollution-abatement expenditures at existing plants of $9.0 billion or $1.0 billion per year; and (3) miscellaneous non-steel expenditures of $4.5 billion or $.5 billion per year. Thus, total capital outlays amount to $45.25 billion or $5.0 billion per year for the nine-year period 1975-1983 - this to maintain existing capacity of 155 million net tons of raw steel and to expand existing capacity by 30 million net tons of raw steel by 1983.

161. We should note that these costs would be much higher if we assume that the entire 30 million net tons of capacity-expansion would be accomplished by the "greenfield" approach, which would mean that the 30 million additional net tons of capacity would cost about $20.3 billion. On the other hand, if we assume that all of the added capacity expansion could be accomplished by

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25/ F.M. Thayer, Jr., "The Capital Formation Challenge Facing the Steel Industry," in AISI (ed.), Fourth National Seminar, Steel Industry Economics, 1975 Report of Proceedings.

"rounding out" existing facilities, then total cost would be $10.5 billion for the nine-year period 1975-1983. For many developing countries, particularly in view of the need to finance substantial parts of such investments externally and debt-service problems that are already difficult, the capital problems associated with major iron and steel industry development could well be a significant constraint.

Labour requirements

162. In the developed countries steelmaking tends to be a capital-intensive industry, particularly with respect to some of the newer technologies. In the United States, about 3.3 hours of production labour and 1.1 hours of other labour were required during the 1970-74 period, costing roughly $27 per ton of steel produced. As indicated earlier, these values are much more favourable in the case of Japan. A substantial amount of the labour used in the steel industry is skilled, which may pose a problem for some developing countries.

163. Table 9 summarizes the capital, labour and raw materials requirements for iron and steel production discussed in this study. Each may represent a significant constraint for one or more developing countries. None is insuperable, as various steelmaking projects in the developing countries have shown. Perhaps the most ambitious of these - and one that attempts to avoid the import requirements of conventional technologies - is the Orinoco project of the Venezuelan National Steel Company. In a venture designed to produce 4 million tons of steel annually, and costing in excess of $4 billion, the facility will use pelletized iron ore in 10 electric furnaces, and will include the capability to produce steel slabs, bars, wire rods, as well as final flat and structural steel products. It is estimated that productivity would reach a level of 10 manhours per ton, competitive with some of the most efficient developed-country mills. However, because of the expected rapid growth of Venezuelan domestic steel demand, it is not likely that this facility will be aimed at major export markets for the foreseeable future.

Environmental factors

164. Environmental considerations have proven to be a major problem for the iron and steel industry in the developed countries. While the pollution control costs per ton of crude steel generally is within reasonable bounds, the capital costs for environmental hardware can be significant indeed. 26/ However, the developing countries are considered to have a number of environmental advantages that include lower population densities in certain potential steelmaking regions, lower environmental preferences, and sometimes superior abilities to assimilate pollutants. Hence it could be argued that from the perspective of efficient use of global environmental resources there should be an incremental shift in the location of steelmaking facilities toward the developing countries. 27/ Pollution control technology exists to keep environmental damage within reasonable bounds, while direct reduction and continuous casting processes are in any case less damaging to the natural environment than conventional steelmaking processes.

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26/ See Organization for Economic Co-operation and Development, Emission Control Costs in the Iron and Steel Industry (Paris: OECD, 1977).

27/ See Ingo Walter, International Economics of Pollution (London: Macmillan, 1975).

Table 9

Coefficients estimated for the iron and steel industry in 1974

(1) Capital coefficients

| | | |
|---|---|---|
| (A) | Capital coefficient for establishing new plants ($/net ton) | 675 |
| (B) | Capital coefficient for expanding existing plants ($/net ton) | 350 |
| (C) | Capital coefficients for maintaining existing plants | |
| (i) | for maintaining present capacity ($/net ton) | 13.0 |
| (ii) | for pollution abatement ($/net ton) | 6.5 |
| (iii) | for miscellaneous non-steel expenditures ($/net ton) | 3.0 |

(2) Employment coefficients

Hours per net ton of iron and steel production

| | | |
|---|---|---|
| (A) | wages | 3.2 |
| (B) | salaries | 1.0 |
| | | 4.2 |

(3) Raw material coefficients for pig iron production
(per net ton)

| | | |
|---|---|---|
| (A) | Iron ore and agglomerate products | 1.618 |
| (B) | Scrap | 0.031 |
| (C) | Mill cinder, roll scale, etc. | 0.048 |
| (D) | Limestone, dolomite and other flux materials | 0.244 |
| (E) | Coking | 0.609 |

(4) Raw material coefficients for raw steel production
(per net ton)

| | | Open hearth | Basic oxygen | Electric |
|---|---|---|---|---|
| (A) | Scrap | 0.53 | 0.38 | 1.01 |
| (B) | Pig iron | 0.66 | 0.80 | 0.04 |

Source: AISI, Annual Statistical Report, 1974, tables 7 and 9, and Statistical Abstract of the United States for index of output.

## IV. TRADE PROSPECTS FOR DEVELOPING COUNTRIES

165. Given the current structural and adjustment problems in the world iron and steel industry, some form of international market organization seems virtually inevitable. The "reference price" regimes implemented by both the European Community and the United States in late 1977 and early 1978 - combined with pre-existing "voluntary" export restraints, import quotas and other types of non-tariff barriers as well as various types of government aids to promote exports - identify the iron and steel industry as a "sensitive" sector where the dynamics of the marketplace are not going to be allowed to work themselves out. Quite apart from the question whether the developing countries will be able to establish internationally competitive iron and steel sectors is the equally important question whether they will be able to perform on the basis of any such competitive advantage. In addition, the fact that the iron and steel industry in most developed and developing countries is either owned or heavily influenced by government makes the prospects of adequate market access even more problematic.

166. It would be rather misleading to suggest, therefore, that an internationally-competitive iron and steel sector in developing countries will be able to transform its comparative advantage into shifts in patterns of international trade in this sector and, consequently, shifts in the global allocation of iron and steel production along market-determined lines. As The Economist has noted, "...there is no future these days in looking for a free-market solution to steel's troubles. This would produce the right answer, that steel (a low-value-added industry) should switch to the less developed industrial world. But that would cause such political pain that not even the hardest-hearted American or European government would tolerate it. Jobs apart, there are many other respectable-sounding arguments against allowing it to occur rapidly. The least specious of these is that steel is still a strategic material..." 28/

167. Instead, protection and subsidies in the principal steel importing and exporting economies - the United States, the EEC and Japan - are certain to lead to market organization at the international level as well. For the developing countries this means controlled and restricted market access. Perhaps most disturbing have been the recurrent proposals to deal with overcapacity in the world iron and steel industry in part by restricting capacity in newly emerging steel suppliers, particularly the developing countries. The argument is that the steel industries of Western Europe and the United States will take years to restructure and modernize, and Japan will continue to depend heavily on exports to world markets. Under such conditions, it is argued, the worst thing that could happen is major new steelmaking capacity coming on stream in developing countries that not only would erode traditional and relatively rapidly-growing export markets in developing nations for steel mills in industrial countries, but would also be the source of increasing competition in their home markets and third countries as well.

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28/ The Economist, 15 October 1977, p. 86.

168. Hence, together with other "sensitive" sectors like textiles, electronic products and shoes, the prospect of major steel imports from developing countries is a disturbing element in some of the major industrial nations. In response, the European textile industry, for example, has developed proposals for curbs on aid for new factories in developing countries and the Association of West European Shipbuilders has called for curbs on developing-country shipbuilding capacity. Responding to similar pressures in the steel industry, the Carter Administration in the United States has suggested restraints on exports to developing countries of major new steelmaking facilities. 29/ The apparent view is that the developing countries themselves cannot supply steelmaking equipment of sufficient quality to make their steel firms internationally competitive. Explicit or tacit agreements by the industrial countries not to supply such equipment would thus prevent the disruptive incremental capacity from materializing in the foreseeable future. At an OECD meeting on the steel industry in September 1977, the United States Administration also noted its concern about the rapid growth of new steel industries in the developing countries in the light of existing global overcapacity and the role of steel as a "sensitive" industry, particulary in Europe and the United States.

169. It is difficult to believe that such proposals to impair the developing countries' steelmaking capacity, while consistent with the emerging non-market approaches to the steel industry's problems, should be taken seriously. They are in fundamental opposition to historical commitments by the developed market-economy countries both to the static and dynamic contributions of liberal international trade and to economic progress in the developing world. Nevertheless, the developing countries themselves should take a firm stand against such measures, both in bilateral contacts with developed countries and in international organizations.

170. Less drastic are proposals to organize international steel markets. One of the least onerous proposals has been advanced by Giovanni Agnelli at the 1977 meeting of the International Iron and Steel Institute. He proposed negotiation of a broad-based "orderly marketing agreement" in steel which would give the developing countries a greater share of global basic steel production while developed countries would concentrate increasingly on high-technology and speciality steel. It was estimated that any country with a population of 8 million or more can support a basic steelmaking facility operating at acceptable levels of scale and efficiency, and hence the developing countries should have the opportunity to capture a significant share of the market at lower levels of sophistication - broadly in accordance with their comparative advantage but carefully managed within the context of an international orderly marketing setup.

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29/ Paul W. Lewis, "Moral Dilemma for the West," The New York Times, 13 September 1977.

171. Less supportive of developing country interests was a similar proposal by George A. Stinson - chairman of National Steel Corporation in the United States and serving as chairman of the International Iron and Steel Institute - to formalize orderly marketing arrangements under the GATT. Such agreements could be based on indexes of capacity utilization, employment in the industry, or growth of imports, with agreed triggers based on one or more of these variables giving a country an automatic right to apply restrictions on imports. Indeed, as part of the GATT Multilateral Trade Negotiations there evidently has been some movement toward an international safeguards arrangement in steel which would give governments the right to impose temporary import restraints if injury can be shown. A special GATT sectoral committee would examine international trade flows in steel and, upon finding injury, would sanction a specific remedy. This of course falls short of a more far-reaching organization of steel trade along the lines of the Multifibre Arrangement (MFA). However, the latter approach is also under investigation in the GATT as a possible approach to the problem.

172. Least onerous of all to the interests of the developing countries are proposals among the major steel producing and consuming countries to co-operate in restructuring their respective iron and steel industries to align them more closely to evolving demand patterns and real international comparative advantage, and to alleviate some of the adjustment burdens involved.

173. An example of possible modes of co-operation among the major steel-producing developed countries is an arrangement in OECD between the United States, Japan and the EEC in November of 1977. They agreed to work together in attempts to resolve structural difficulties in the iron and steel sector and preserve liberal trade. This includes a monitoring scheme to permit both long-range planning for the industry and to serve as an "early warning system" to spot incipient problems.

174. Three "general principles" were agreed in the special committee on the iron and steel sector, which had been set up several months earlier: (a) First priority must go to reform and restructuring of the industry to facilitate rational resource allocation but without shifting adjustment burdens from one country to another; (b) Any measures undertaken should avoid quantitative trade restrictions and preserve the "free and fair flow of trade"; and (c) Whereas antidumping efforts should take into account customary trade patterns, no country should be expected to accept large quantities of steel imports at unjustifiably low prices. The agreement recognizes the importance of recessions in exacerbating trade and adjustment problems in the iron and steel industry, and in making otherwise rational solutions politically difficult or impossible.

175. It seems unlikely that policy in the iron and steel sector will be confined to mutual co-operation and consultation, however. Rather more probable is some form of market-sharing arrangement at the international level along the lines of the MFA in textiles and its predecessors. As noted, the minimum- or reference-price regimes established by the EEC and the United States in 1977-1978, and Japanese implicit agreement, can be interpreted as a signal that such an international arrangement will eventually emerge. Much of the manoeuvring and protectionist pressure by national steel firms in the United States and Europe can be viewed as an attempt to achieve this kind of permanent outcome in the iron and steel sector.

176. Despite some of the supply problems faced by developing countries in the iron and steel sector noted above, it is probable that with appropriate measures developing countries could develop industries that would be internationally competitive based on low labour costs, modern mills embodying the latest technologies, efficient coastal sites near sources of raw materials, and the ability to shop for missing inputs from the least-cost global suppliers. Accordingly, the best policy environment for the developing countries would appear to be liberal trade in iron and steel - meaning liberalization of tariffs and non-tariff barriers to market-access for exports and elimination of subsidies and other competitive distortions.

177. Since this appears to be the optimum outcome for the developing countries - combining unrestricted market access for those developing countries having significant capabilities in iron and steel exports with a highly competitive world steel market for developing countries' import needs - the directions for policy are clear. They include: (a) continued tariff liberalization in the iron and steel sector with special attention to reducing the degree of tariff escalation; (b) liberalization of non-tariff barriers to trade in steel, including the elimination of minimum import price regimes; (c) affirmative adjustment in the developed countries' iron and steel industries to provide for the elimination of obsolescent and inefficient plants, restructuring the economies of the affected regions by facilitating entry of replacement industries matching the work force and skills of workers formerly employed in the steel industry and encouraging firms to move to more sophisticated and technology-intensive product lines; and (d) continuation and liberalization of generalized system of preferences coverage of steel imports from the developing countries.

178. If, on the other hand, world steel markets are going to be organized along MFA or similar lines, the policy response of the developing countries will have to be quite different.

179. First, since the iron and steel markets in the developed countries will be increasingly distorted by import restrictions, price controls and other anti-competitive measures, and government subsidies, there is the likelihood that developed country steel suppliers will have an artificial competitive edge in developing-country markets as well. This may provide short-term gains for non-steelmaking developing countries as high developed-country domestic prices are used to subsidize low export prices. But this advantage will tend to disappear as strong steel demand in developed countries cuts the incentive to promote exports to developing countries - and there is always the possibility that developed country steel suppliers will attempt to cartelize developing country markets as well as their own. All of this may take place in a period when, as noted, steel demand in developing countries will grow much faster than in developed countries.

180. Under such circumstances there is the question whether the developing countries ought not to follow "second-best" trade policies themselves - to recognize the distortion of the world steel market and to pursue policies that will minimize the effects of those distortions on their own levels of real income and rates of economic growth. One possibility would be for steelmaking developing countries to implement "reference price" schemes of their own to prevent subsidized incursions of developed-country steel,

especially in times of economic slack. In addition, the developing countries might pursue sectoral regional free trade arrangements, both to ensure larger markets for steelmaking developing countries and to assure access to steel for developing countries dependent on imports for their steel supplies. Such arrangements probably could be of the "free trade area" rather that the "customs union" variety in order to minimize trade diversion at the sectoral level. This would permit a significant part of the rapid-growth markets for steel to be served by developing country suppliers. Trade among the developing countries in iron and steel products may also benefit from lower transportation costs, and escalation in ocean freight rates in the future will tend to reinforce this advantage.

181. Second, developing countries should argue for exemption from developed country steel import controls on the grounds that they are too small to constitute a major disruptive influence. This would provide market-access advantages particularly for emerging steel suppliers in developing countries. Such an exemption could be applied to "reference price" import regimes as well as MFA-type quantitative trade controls.

182. Third, the developing countries should press for the maintenance and extension of GSP treatment of iron and steel products, including the elimination or enlargement of "competitive need" types of import ceilings.

182. Fourth, the developing countries should consider entering into agreements with developed-country steel firms for the supply of semis, whether or not international steel trade is controlled, where efficiency gains and cost savings can be achieved by more disaggregated specialization in iron and steel production between developed and developing countries. On the other hand, the developing countries should also press ahead with efforts at further downstream value-added in the steel sector, in such steel-intensive manufacturing as hand tools, castings, steel furniture, and the like. These are sectors where "indirect" exports of steel might be achieved without confronting the sensitivity and trade controls characteristic of the steel industry itself and at the same time taking advantage of broad-based trade liberalization and GSP-eligibility of steel-intensive manufactures as well as the developing countries' own competitive advantages in manufacturing based on labour cost differentials.

183. Finally, whether to make use of a fundamental competitive advantage under liberal trade conditions or to create and maintain export opportunities in controlled international steel markets, the developing countries must pay close attention to the supply side. Besides realistic assessment of long-range competitiveness in each of the areas noted earlier - capital, labour, technology and basic materials inputs and economies of scale - this means establishing links to steel service centres and other marketing efforts that assure customers competitive pricing, delivery terms and quality.